WEMMH/SB/21 (4/03)

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

		Application Number	10/602,905
		Filing Date	June 24, 2003
		First Named Inventor	James A. HOFF
		Group Art Unit	3727
		Examiner Name	James N. Smalley
Total Number of Pages in this Submission		Attorney Docket Number	1104-964/RKE-075

ENCLOSURES (check all that apply)

☒ Fee Transmittal Form	☐ Assignment Papers	☐ After Allowance Communication to Group
☒ Fee Attached see PTO-2038 form	☐ Drawing(s)	☐ Appeal Communication to Board of Appeals and Interferences
☐ Amendment Response	☐ Licensing-related Papers	☒ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
☐ After Final	☐ To Convert a Provisional Application	☐ Proprietary Information
☐ Affidavits/declaration(s)	☐ Power of Attorney, and Correspondence Address Form	☐ Status Letter
☐ Extension of Time Request	☐ Terminal Disclaimer	☐ Additional Enclosure (please identify below)
☐ Express Abandonment Request	☐ Small Entity Statement	☒ Return Receipt Postcard
☐ Information Disclosure Statement	☐ Request for Refund	
☐ Certified Copy of Priority Documents		
☐ Response to Missing Parts/ Incomplete Application	Remarks	
☐ Response to Missing Parts under 37 CRF 1.52 or 1.53		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual Name	**James M. Durlacher** **Woodard, Emhardt, Moriarty, McNett & Henry LLP**
Signature	James M. Durlacher
Date	**March 15, 2006**

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SB/17 (01-06)
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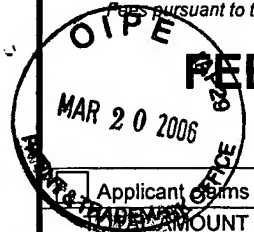

Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2006

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($)500.00

Complete if Known	
Application Number	10/602,905
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Attorney Docket No.	1104-964/RKE-075

METHOD OF PAYMENT *(check all that apply)*

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☒ Deposit Account Deposit Account number: 23-3030 Deposit Account Name: Woodard, Emhardt, Moriarty, McNett & Henry LLP

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
		Small Entity		Small Entity		Small Entity	
Application Type	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	0
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims		Extra Claims	Fee ($)	Fee Paid ($)	Multiple Dependent Claims Fee ($)	Multiple Dependent Claims Fee Paid ($)
	-20 or HP	=	x 50	=0	x 360	=0

HP = highest number of total claims paid for, if greater than 20

Independent Claims		Extra Claims	Fee ($)	Fee Paid ($)
	-3 or HP	=	x 200	=0

HP = highest number of independent claims paid for, if greater than 3

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 C.F.R. 1.16(s).

Total Sheets		Extra Sheets		Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
	-100	=	/50	= (round up to a whole number)	x	0

4. OTHER FEE(S)

	Fee Paid ($)
Fee for filing Appeal Brief	500.00

SUBMITTED BY

Signature	James M. Durlacher	Registration No. (Attorney/Agent)	28,840	Telephone	(317) 634-3456
Name (Print/Type)	James M. Durlacher			Date	March 15, 2006

CERTIFICATE OF MAILING OR TRANSMISSION

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Name (Print/Type)	James M. Durlacher		
Signature	James M. Durlacher	Date	March 15, 2006

3M 04-964:JMD:#384224

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:	)	
	)	Before the Examiner
James A. HOFF	)	
	)	James N. Smalley
Serial No. 10/602,905	)	
	)	Group Art Unit 3727
Filed June 24, 2003	)	
	)	March 15, 2006
CLOSURE ASSEMBLY	)	

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March 15, 2006

(Date of Deposit)

James M. Durlacher

Name of Registered Representative

James M. Durlacher

Signature

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And Interferences

APPELLANT'S APPEAL BRIEF

TABLE OF CONTENTS

I. INTRODUCTORY COMMENTS

This Appeal Brief is being filed pursuant to 37 CFR 41.37. The Notice of Appeal was filed January 25, 2006. Accordingly, the Appeal Brief is being filed within two (2) months of the Notice of Appeal. The required fee of $500 is submitted by credit card authorization.

II. REAL PARTY IN INTEREST

The real party in interest is both the Assignee, Rieke Corporation, of Auburn, Indiana, and TriMas Corporation of Bloomfield Hills, Michigan.

Rieke Corporation is an indirect wholly-owned subsidiary of TriMas Corporation. The full business addresses and states of incorporation of each of these entities are listed below:

Rieke Corporation
500 West Seventh Street
Auburn, Indiana 46706

A corporation of the State of Indiana

TriMas Corporation
39400 Woodward Avenue
Bloomfield Hills, Michigan 48304

A corporation of the State of Delaware

III. RELATED APPEALS AND INTERFERENCES

None.

IV. STATUS OF CLAIMS

The claims on appeal include claims 1, 2, 3, 4, 5, 7, 8, 9, 13, 14, 15, 16, and 17. The status of all claims in the subject patent application is set forth below.

Claim No.	Current Status
1	Pending
2	Pending
3	Pending
4	Pending
5	Pending
6	Canceled
7	Pending
8	Pending
9	Pending
10	Canceled
11	Canceled
12	Canceled
13	Pending
14	Pending
15	Pending
16	Pending
17	Pending
18	Canceled
19	Canceled
20	Canceled
21	Canceled
22	Canceled
23	Canceled
24	Canceled
25	Canceled
26	Canceled
27	Canceled
28	Canceled

V. STATUS OF AMENDMENTS

A Final Office Action issued in the parent patent application on June 30, 2005 wherein claims 1-5, 7-9, 11, 13-18, and 28 were pending. Claim 28 was withdrawn from consideration and claims 1-5, 7-9, 11, and 13-18 were rejected.

A response to this Final Office Action was filed September 30, 2005. In the Advisory Action dated October 17, 2005, the Examiner stated that the Amendment failed to place the application in condition for allowance. A Request for Continued Examination (RCE) was filed on October 24, 2005. The first Office Action in this RCE application issued November 30, 2005 and was made Final. The November 30, 2005 Office Action represents the Final rejection for the purposes of this Appeal. There has not been any amendment filed subsequent to this Final rejection of claims 1-5, 7-9, and 13-17 as set forth in the November 30, 2005 Final Office Action.

VI. SUMMARY OF CLAIMED SUBJECT MATTER

The independent claims involved in this Appeal are claims 1 and 13.

A. A Concise Explanation of Claim 1

Claim 1 recites a closing plug (22) that is externally threaded and constructed to thread into internally-threaded flange (21). This internally-threaded flange (21) is assembled into a drum end (24). This structural combination is described on page 7 of the application in lines 12-20 and it is illustrated in drawings Figures 1 and 2, for example. The closing plug (22) includes an externally-threaded body (31) and an upper radial flange (32). These features are described on page 7 of the application, in lines 19-20, and they are illustrated in drawing Figures 4 and 5.

A plurality of spaced-apart, axially-protruding projections (39a-39f) extend from the radial flange (32) in the direction of the drum end (24). These features are described on page 7 of the application, in lines 29-32, and they are illustrated in drawing Figures 1, 2, and 5.

The projections (39a-39f) function to limit the threaded advancement of the plug (22) by abutment of one or more projections (39a-39f) against the upper surface of the drum end (24). This functional result is described on page 10 of the application, in lines 1-8, and it is illustrated in drawing Figures 1 and 2.

B. A Concise Explanation of Claim 13

Claim 13 recites a drum closure (20) for a drum end (24) that includes a threaded flange (21) and a closing plug (22) where the closing plug (22) is received by the threaded flange (21). This combination is described on page 7 of the application, in lines 12-20, and it is illustrated in drawing Figures 1 and 2.

The closing plug (22) includes a threaded body (31) and a radial flange (32). These features are described on page 7 of the application, in lines 19-20, and they are illustrated in drawing Figures 4 and 5.

A plurality of spaced-apart, axially-protruding projections (39a-39f) extend from the radial flange (32) in the direction of the drum end (24). These features are described on page 7 of the application, in lines 29-32, and they are illustrated in drawing Figures 1, 2, and 5.

The projections (39a-39f) function to limit the threaded advancement of the plug (22) by abutment of one or more projections (39a-39f) against the upper surface of the drum end (24). This functional result is described on page 10 of the application, in lines 1-8, and it is illustrated in drawing Figures 1 and 2.

A sealing gasket (23) is positioned around the threaded body (31) for sealing between the radial flange (32) and the drum end (24). This combination is described on page 7 of the application, in lines 13-14, and on page 9, in lines 10-22, and it is illustrated in drawing Figures 1 and 2.

VII. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. **Whether Claims 1, 8 and 9 are unpatenable under 35 U.S.C. §102(b) over Bradshaw et al. (U.S. Patent No. 4,105,135) in reference to Baughman (U.S. Patent No. 5,680,953).**

B. **Whether Claims 2, 3, 4, 5, 7, and 18 are unpatentable under 35 U.S.C. §103(a) over Bradshaw et al. (U.S. Patent No. 4,105,135).**

C. **Whether Claim 13 is unpatentable under 35 U.S.C. §103(a) over Baughman (U.S. Patent No. 5,680,953).**

D. **Whether Claims 13, 14, 15, 16, 17, and 18 are unpatentable under 35 U.S.C. §103(a) over Ziegler et al. U.S. Patent No. 4,124,140) in view of Bradshaw et al. (U.S. Patent No. 4,105,135).**

As discussed in greater detail in the Argument portion that follows, Appellant believes that some of the claim numbers, as set forth by the Examiner in the Final Office Action, are in error. With regard to the rejection of claims 1, 8, and 9, this is believed to be claims 1, 5, and 9. With regard to the rejection of claims 2, 3, 4, 5, 7, and 18, this is believed to be claims 2, 3, 4, 5, 7, and 8. Finally, the rejection of claims 13, 14, 15, 16, 17, and 18 is believed to be claims 13, 14, 15, 16, and 17. Appellant's reasons for believing that a numbering error has been made by the Examiner involves the grouping of claims 5 and 9 in the second paragraph on page 3 of the Final Office Action and the similar claim language for claims 5 and 9. With regard to the change of claim 18 to 8 and the elimination of claim 18, it will be noted that claim 18 has been canceled. If the first stated rejection is in fact claims 1, 5 and 9, then without changing claim 18 to claim 8 in the second rejection, claim 8 would not be addressed in the Final Office Action.

VIII. ARGUMENT

A. (First Grounds)
Rejection Under 35 U.S.C. §102(b) over Bradshaw et al. (U.S. Patent No. 4,105,135) in reference to Baughman (U.S. Patent No. 5,680,953).

Introductory Comments

There are three claims in this first grounds of rejection, including, as stated by the Examiner, claims 1, 8 and 9, and these three claims will be separately argued as two groups. Claim 1 is in one group and claims 8 and 9, or more accurately claims 5 and 9, are in the second group. Please note the comments that follow with regard to the claim numbering issue between claims 5 and 8.

The Board's attention is directed to Paragraph 3 of the Final Office Action and the Examiner's reference to claims 1, 8 and 9. However, in the discussion on page 3 of the Final Office Action, the Examiner refers to claims 1, 5, and 9. It is not clear how this claim issue should be handled in this Brief. Since claims 5 and 9 recite basically the same feature, it is being assumed that the Examiner intended to initially state claims 1, 5, and 9. Then, in the second grounds of rejection where claim 18 is listed, it is being assumed that the Examiner intended to list claim 8. There are two reasons for this assumption. First, there is no claim 18 presently pending in the application and, secondly, claims 4 and 8 recite basically the same feature.

Claim 1

The Examiner contends that the scallops (8) of Bradshaw et al. are capable of being used in the intended manner. Appellant disagrees. Appellant's axially-extending projections are constructed to abut up against a surface of the drum end and thereby limit

the threaded advancement of the plug. The style of closure, the style of plug, and the configuration of the individual projections all have to be constructed and arranged in harmony with each other in order to achieve the desired end result. This desired end result is explained on page 10 of the application, in lines 1-17.

What the Examiner wants to do in terms of the rejection of claim 1 is not entirely clear. Initially it was thought that the Examiner wanted to redesign the plug of Bradshaw et al., but that obviously cannot be done, as further discussed below. Perhaps the Examiner wants to take the plug of Bradshaw et al. and assemble it into some hand-picked "flange". The selected structure for this approach is to use the outlet (21) of lid (23) of Baughman. The problem with this hindsight approach of selectively picking and choosing between various references is that this unitary plastic lid (23) of Baughman is not a "flange" as that term must be defined based upon Appellant's application. Another issue is whether the raised outlet (21) of lid (23) in Baughman actually defines a "surface of the drum end" as that language is used in claim 1 of Appellant's application.

Further, the "projections" (i.e., scallops (8)) of Bradshaw et al. are too long (axially) to function properly in the Baughman lid (23). This added projection length of Bradshaw et al. is not compatible with several aspects of Baughman and these aspects of incompatibility preclude a finding that it would be obvious to one of ordinary skill in the art to combine Bradshaw et al. and Baughman. Clearly, there is nothing stated in either Bradshaw et al. or in Baughman which would suggest this hand picked combination of features and there is no direction or motivation set forth in Bradshaw et al. suggesting that the plug could be exported to a different closure system. There is also nothing in

Baughman to suggest that a plug style similar to that of Bradshaw et al. would be desirable or even suitable.

Appellant also disagrees with the Examiner's loose interpretation of Baughman, wherein the Examiner states that Baughman discloses "a similarly-dimensioned axial projection" that "abuts a drum surface". There is nothing factually available to the Examiner to reach this conclusion and dimensioning of an issued patent is not an accepted procedure, since utility patent drawings are not drawn to scale. Further, outer wall (56) of Baughman is an annular form and is not "a plurality of spaced-apart" axially-protruding projections.

If the Examiner believes that it would be obvious to redesign the Bradshaw et al. scallops (8) in order to create abutment as part of the existing Bradshaw et al. structure, then the scallops (8) must have a significantly increased axial length. There are only two ways to possibly achieve this increase in axial length. One way might be to bend more material down or significantly increase the diameter size to have more material available.

It is clear that the Bradshaw et al. structure employs a plug whose upper portion begins as a circular form as described in the Abstract of Bradshaw et al. If one would envision a need for more axial length for each formed and down-turned scallop (8), and if the starting diameter size of that upper portion stays the same, then the radial width of the channel that receives the gasket becomes too small to fit over the remainder of the closure construction. Conceivably, adjacent scallops, in terms of their concave outer surface, would overlap each other in a desire to draw more material in the downward direction for increased axial length. The question then is what other re-designs have to be

incorporated into the Bradshaw et al. structure once the free edge projections (7) disappear.

Increasing the diameter size of this upper portion of Bradshaw et al. in order to have more material to bend down, represents an added material expense and there is simply no basis in Bradshaw et al. to change the scallops (8) in this manner. Further, as clearly set forth in Bradshaw et al., the scallops (8) and the alternating edge projections (7) are cooperatively designed to enable gripping, by hand, presumably allowing these various contours a better fit with the fingers and in between the fingers of the user. It thus has to be questioned how the ergonomics for gripping would be affected by increasing the preferred or desired outside diameter by roughly twice its preferred size simply to have more material for lengthening the scallops (8) in an axial direction. A further ergonomic reality is that, as the scallops (8) increase in axial length, the fingers of the user are unable to curve beneath the scallops in order to strengthen the gripping hold of the user's hand on the plug. One's gripping ability is not the same if the extended fingers are straight rather than curled beneath the surface being gripped.

Even with all of these unacceptable re-design realities, the fact remains that neither Bradshaw et al. nor Baughman provide any suggestion of Appellant's claimed invention and are silent as to any combination of features proposed by the Examiner.

Over the years the Court of Customs and Patent Appeals (CCPA) and more recently the Court of Appeals for the Federal Circuit (CAFC) have addressed the issue of what criteria is to be applied when combining two or more references under 35 U.S.C. §103. While the facts may differ from case to case and while the CAFC panel may

change, the legal precedent established by the Board of Patent Appeals and Interferences and the CCPA has been followed and strengthened by the later cases of the CAFC. Clearly and succinctly stated, before obviousness may be established, the examiner must show that there is either a suggestion in the art to produce the claimed invention or a compelling motivation based on sound scientific principles. Ex parte Kranz, 19 USPQ2d 1216, 1218 (Bd. Pat. App. & Inter., 1990). The case law makes it clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is vigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. C.R. Bard, Inc. v. M3 Sys., Inc., 157 F.3d 1340 (Fed. Cir. 1998). Obviousness cannot be established by combining the teachings of prior art in order to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. In re Geiger, 2 USPQ2d 1276 (Fed. Cir. 1987). It is improper to reject the claimed invention for obviousness when nothing in the cited references, either alone or in combination, suggests or teaches the claimed invention. Evidence of teaching or suggestion is "essential" to avoid hindsight. In re Fine, 5 USPQ2d 1596 (Fed. Cir. 1988). Stated slightly differently, the mere fact that the prior art may be modified to reflect features of the claimed invention does not make modification, and hence the claimed invention, obvious unless the desirability of such modification is suggested by the prior art. In re Fritch, 23 USPQ2d 1780 (Fed. Cir. 1992).

It is generally accepted, however, that it is improper to change the basic principle under which the primary reference was intended to operate. In re Ratti, 123 USPQ 349 (CCPA 1959). It is not enough to pick out isolated features in earlier prior art patents, combine them in one particular way with the application of hindsight acquired only from

the applicant's own disclosure, and then say that it would have been obvious to select those particular features and to combine them in the particular way in which the applicant has. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. There must be some teaching or suggestion in the references to support their use in the particular claimed invention. Smithkline Diagnostics, Inc. v. Helena Laboratories Corp., 8 USPQ2d 1468 (Fed. Cir. 1988).

There must be some logical reason apparent from positive concrete evidence in the record that justifies a combination of primary and secondary references. In re Regel, Buchel and Plempel, 188 USPQ 136 (CCPA 1975). It is insufficient to show merely that each separate element of a claimed combination can be found in one or various prior art references. The mere fact that it is possible to find two isolated disclosures which might be combined in such a way to produce a new invention does not necessarily render such new invention obvious unless the prior art also contains something to suggest the desirability of the combination. In re Gergen, 11 USPQ2d 1652, (Fed. Cir. 1989).
It is impermissible within the framework of Section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. In re Wesslau, 147 USPQ 391, (CCPA, 1965), Bausch & Lomb v. Barnes-Hind/Hydrocurve, 230 USPQ 416 (CAFC, 1986). Without the benefit of applicant's disclosure, a person of ordinary skill in the art would not know what portions of the reference to consider and what portions to disregard as irrelevant, or misleading. In re Mercier, 185 USPQ 774 (CCPA, 1975). Combining prior art references without

evidence of such a suggestion, teaching or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability – the essence of hindsight. Interconnect Planning Corp. v. Feil, 774 F2d 1132 (Fed. Cir. 1985).

Claims 5 and 9

Claims 5 and 9 each recite that each projection has a substantially flat lower surface that is substantially perpendicular to the longitudinal axis. These two dependent claims depend either directly (claim 9) or indirectly (claim 5) from independent claim 1. As such, all of the arguments directed to the allowable nature of claim 1 are incorporated by reference into this argument directed to the allowable nature of claims 5 and 9.

Additionally, claims 5 and 9 recite a structure that is not met by Bradshaw et al. The only reason that these two claims are at issue is because the Examiner has adopted an interpretation of the claim language that is not supported by conventional practice or usage and is not supported by the specification. While not suggesting any improper motive on the part of the Examiner, he has gone that extra measure to rule against patentability by adopting an interpretation of the claim language that is simply incorrect, inaccurate, and unsupported.

The operative words of claims 5 and 9 are "substantially flat lower surface". This structure is illustrated in FIG. 5 and described in the specification relative to surfaces (40a-40f) of each protruding portion. The Examiner can readily see that the Bradshaw et al. scallops (8) have a curved lower surface, not a "substantially flat" lower surface. The Examiner has taken this claim language and has attempted to apply it to a radial line drawn from the center of the Bradshaw et al. plug outwardly to contact the lowest-most

line or point of the scallop (8). However, a "line" is not a "surface". A suitable dictionary definition for "surface" defines it as "any figure having only two dimensions", i.e., an area. This is from Webster's Unabridged Dictionary of the English Language, RHR Press, © 2001. Other definitions include "any face of a body or thing"; "outermost or uppermost layer or area"; and "extent or area of outer face". None of these definitions are satisfied by a radial line (i.e., only one dimension). Appellant's understand the role of an Examiner and the responsibility to critically analyze each element of each claim relative to the prior art. However, when an interpretation is adopted that is clearly at odds with all conventional custom, practice, usage, and available definitions, the Board needs to intervene. Appellant has been unable to find any support for a radial line being or defining a surface.

Further, the Bradshaw et al. reference does not describe the lower curved edges of the scallops (8) as being a substantially flat lower surface. Also, since it is improper to try and bolster a "teaching" by scaling patent drawings since they are not drawn to scale, how would anyone be able to conclude that the entire lower curved edge of each scallop (8) is colinear with a radial line?

B. (Second Grounds)
Rejection Under 35 U.S.C. §103(a) over Bradshaw et al.
(U.S. Patent No. 4,105,135).

Introductory Comments

There are six (6) claims in this second grounds of rejection, including claims 2, 3, 4, 5, 7, and 8. Claims 2-5 will be separately argued, with the focus being on the first dependent claim, claim 2. It is noted that the allowance of claim 2 would place claims 3,

4, and 5 in condition for allowance. Claims 7 and 8 depend from claim 1 and are not being separately argued. Instead, the arguments directed to claim 1 are adopted and incorporated by reference herein. Further, the allowance of claim 1 will place claims 2, 3, 4, 5, 7, and 8 in condition for allowance.

Claims, 2, 3, 4, and 5

With regard to claim 2, the Examiner correctly acknowledges that Bradshaw et al. does not teach the radial flange having a modified hex shape, nor does Bradshaw et al. disclose six (6) projections (see claim 3). The Examiner contends that it would be obvious to modify the closure of Bradshaw et al. in order to create six projections. The Examiner apparently believes that there is a "benefit of increasing the number of points whereby a hand may engage the plug", see page 4, lines 1-3 of the Final Office Action. Appellant has absolutely no clue as to where the Examiner comes up with this particular creation of what he believes might provide a "benefit". There is nothing contained in Bradshaw et al. to support this statement. Further, if it is in fact obvious that the five scallops of Bradshaw et al. would be improved by increasing the number to six, and assuming that that could even be done as a practical matter, it seems surprising that the Bradshaw et al. specification is silent. It is also curious that the Examiner has such insight into the optimal design in terms of the number of scallops to be able to know precisely and exactly that six is better than five, but seven is not better than six. What the Examiner suggests is that the larger the number of scallops, the greater the benefit. If that were true, then why not suggest fifteen or twenty scallops, why stop at six? This seems

to be a "poster child" example of hindsight knowledge or speculation being used by an Examiner and it is clearly improper.

Not only is Bradshaw et al. silent with regard to increasing the number of scallops, there is text in its specification which would suggest that one should not increase the number. In column 2, beginning in line 57, it is stated that the plug head or lip with its above-described rounded surfaces is such that the hand and fingers are protected from injury during hand application of the plug. The smooth rounded surfaces of the plug lip are easily gripped and the plug manipulated, even with a heavily gloved hand. It would seem logical, based upon the disclosed design in Bradshaw et al., that increasing the number of scallops would reduce the rounded surfaces to less rounded surfaces and would create a greater number of corners or more pointed edges. Thus, not only does this action by the Examiner appear to be based on hindsight information and/or assumptions, it also seems to go directly against the teachings of Bradshaw et al.

Even if Bradshaw et al. could add one more scallop without completely destroying its design objectives, the curved (concave) shape of the individual scallops (8) precludes having a hex shape. Furthermore, considering the ergonomics of how a hand would engage the plug, fitting three fingers into three scallops yields a torque area of approximately 216 degrees. Adding a sixth scallop reduces the three finger grip to a torque area of 180 degrees. This sixth scallop would actually detract from the objectives set forth in Bradshaw et al. rather than creating a "benefit" as the Examiner has suggested.

C. **(Third Grounds)**
Rejection Under 35 U.S.C. §103(a) over Baughman
(U.S. Patent No. 5,680,953).

Introductory Comments

There is only one claim in this third grounds of rejection, claim 13.

Claim 13

Claim 13 is rejected based upon Baughman. The only recited feature that the Examiner acknowledges as not being found in Baughman is the plurality of projections.

Clearly though, claim 13 requires a "threaded" flange that is assembled into the drum end and a separate closing plug that is received by this "threaded" flange. Baughman provides a single, unitary, plastic closure (20) that threads directly into the outlet (21) of lid (23). Baughman does not have a "threaded" flange that assembles into the drum end. It seems as if the Examiner may have confused the separate "threaded" flange component with the radial flange portion (69) of closure (20).

In the claim 13 rejection, the Examiner makes no reference to the "threaded" flange and this omission is critical. The Baughman reference does not include any "threaded" flange that assembles into the drum end and which then receives the closing plug or closure (20). This missing or omitted claim element renders the Baughman reference clearly deficient with respect to claim 13.

D. (Fourth Grounds)
Rejection Under 35 U.S.C. §103(a) over Ziegler et al. (U.S. Patent No. 4,124,140) in view of Bradshaw et al. (U.S. Patent No. 4,105,135).

Introductory Comments

There are five (5) claims in this fourth grounds of rejection, including claims 13, 14, 15, 16, and 17. While the Examiner also lists claim 18, claim 18 was canceled and the Examiner apparently overlooked this fact in drafting the rejection. The patentability of claims 13, 15, and 16 will be separately argued in one group. Claim 14 will be separately argued in another group, and claim 17 will be separately argued in a third group. Claims 15 and 16 will not be addressed, but will rely instead on the patentability of claim 13 and their dependency to claim 13.

Claims 13, 15, and 16

Claim 13 is rejected based upon a combination of Ziegler et al. in view of Bradshaw et al. The Examiner believes that Ziegler et al. teaches the claimed invention, except for the plurality of spaced-apart axially-protruding projections. The Examiner is correct that there is at least one deficiency of Ziegler et al. The Examiner contends that Bradshaw et al. includes such projections and that it would have been obvious to use the closure cap of Bradshaw et al. on the Ziegler et al. closure.

A first question that has to be addressed is why one of ordinary skill in the art would ever consider using the closing plug of Bradshaw et al. in the closure of Ziegler et al. There is no suggestion nor any teaching or motivation set forth in either reference for this redesign that appears to be contemplated by the Examiner based on hindsight information. One also has to question as to what might be achieved by this design

modification. The Ziegler et al. disclosure suggests reasons to not use the Bradshaw et al. closing plug such as the desire to have a hexagonal shape for lip 36 so that a standard wrench can be used to tighten the cap in the sleeve (see column 2, lines 64-68 of Ziegler et al.). Using the Bradshaw et al. plug changes the Ziegler et al. design objective in terms of wrench tightening. Use of the Bradshaw et al. plug would presumably change from a wrench tightened design to a manual tightening design based on gripping of the closing plug outside diameter by hand.

Even if the Bradshaw et al. plug is used in Ziegler et al., those arguments previously advanced regarding the deficiencies of Bradshaw et al. relative to claim 1 are clearly applicable with regard to claim 13 and are hereby adopted and incorporated by reference into this claim 13 argument. Additionally, the case authority regarding the obviousness standards, as set forth above as part of the argument for the first grounds of rejection (claim 1), are incorporated by reference into this argument in terms of claim 13.

Claim 14

While claim 14 is argued separately, the recited content of claim 14 is substantially the same as claim 2. While there is a difference in the claim dependencies, the arguments directly specifically to claim 14 are the same as the arguments presented for claim 2. Accordingly, the claim 2 arguments are incorporated by reference as the arguments for claim 14.

Claim 17

While claim 17 is argued separately, the recited content of claim 17 is substantially the same as claims 5 and 9. While there is a difference in the claim dependencies, the arguments directly specifically to claim 17 are the same as the arguments presented for claims 5 and 9. Accordingly, the claims 5 and 9 arguments are incorporated by reference as the argument for claim 17.

Respectfully submitted,

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IX. CLAIMS APPENDIX

1. A closing plug for receipt by a threaded flange that is assembled into a drum end, said closing plug comprising:

a threaded body for receipt by said threaded flange;

a radial flange arranged adjacent a first end of said threaded body; and

a plurality of spaced-apart, axially-protruding projections extending from an outer portion of said radial flange in the direction of said drum end for limiting the threaded advancement of said plug by abutment of one or more of said plurality of axially-protruding projections against a surface of said drum end.

2. The closing plug of claim 1 wherein said radial flange has a modified hex shape.

3. The closing plug of claim 2 wherein said plurality of axially-protruding projections totals six equally-spaced projections.

4. The closing plug of claim 3 wherein each axially-protruding projection is of unitary construction with said radial flange.

5. The closing plug of claim 4 having a longitudinal axis and wherein each axially-protruding projection has a substantially flat lower surface that is substantially perpendicular to said longitudinal axis.

7. The closing plug of claim 1 wherein said plurality of axially-protruding projections totals six equally-spaced projections.

8. The closing plug of claim 1 wherein each axially-protruding projection is of unitary construction with said radial flange.

9. The closing plug of claim 1 having a longitudinal axis and wherein each axially-protruding projection has a substantially flat lower surface that is substantially perpendicular to said longitudinal axis.

13. A drum closure for a drum end comprising:

a threaded flange constructed and arranged for assembly into said drum end;

a closing plug constructed and arranged for receipt by said threaded flange, said closing plug having a threaded body, a radial flange arranged adjacent a first end of said threaded body;

a plurality of spaced-apart, axially-protruding projections extending from an outer portion of said radial flange in the direction of said drum end for limiting the threaded advancement of said plug by abutment of one or more of said plurality of axially-protruding projections against a surface of said drum end; and

a sealing gasket positioned around said threaded body and being constructed and arranged for sealing between said radial flange and said drum end, wherein each of said plurality of axially-protruding projections has an axial length such that contact against said drum end occurs after said closing plug is tightened into said threaded flange to a desired torque for proper sealing gasket compression.

14. The drum closure of claim 13 wherein said radial flange has a modified hex shape.

15. The drum closure of claim 14 wherein said plurality of axially-protruding projections totals six equally-spaced projections.

16. The drum closure of claim 15 wherein each axially-protruding projection is of unitary construction with said radial flange.

17. The drum closure of claim 16 having a longitudinal axis and wherein each axially-protruding projection has a substantially flat lower surface that is substantially perpendicular to said longitudinal axis.

X. EVIDENCE APPENDIX

A. U.S. Patent References

1. U.S. Patent No. 4,105,135 issued August 8, 1978 to Bradshaw et al.

2. U.S. Patent No. 4,124,140 issued November 7, 1978 to Ziegler et al.

3. U.S. Patent No. 5,680,953 issued October 28, 1997 to Baughman.

B. Cases Cited

C. Other references

Dictionary definitions for "surface"

Intellectual Property Library ISSN 1526-8535

FULL TEXT OF CASES (USPQ2D)
All Other Cases

Ex parte Kranz (BdPatApp&Int) 19 USPQ2d 1216 Ex parte Kranz

U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences
19 USPQ2d 1216

Decided June 28, 1990
No. 88-2847

Headnotes

PATENTS

1. Patentability/Validity - Obviousness - Relevant prior art - Particular inventions (§ 115.0903.03)

Patentability/Validity - Obviousness - Combining references (§ 115.0905)

Finding of obviousness requires either suggestion in art to produce claimed invention or compelling motivation based on sound scientific principles, accompanied by general knowledge of existence of techniques recognized in art for carrying out proposed invention; examiner has thus failed to establish prima facie case that claimed process for making target cell susceptible to attack and disintegration by attaching antibody to cell, so that cytotoxic T lymphocyte "killer cell" will recognize target cell and destroy it, is obvious in view of three prior references in combination, since references teach that antibodies to cytotoxic T lymphocyte antigen receptor will be recognized by "killer cell" which will consequently destroy any cell to which antibody is bound, but do not suggest putting phenomena to any practical use or offer advice on accomplishing necessary "attaching" procedure of claimed process.

2. Patentability/Validity - Specification - Enablement (§ 115.1105)

Claimed process for making target cell susceptible to attack and disintegration by attaching antibody to cell so that cytotoxic T lymphocyte "killer cell" will recognize target cell and destroy it is not supported by enabling disclosure in specification required by first paragraph of 35 USC 112, since claimed process involves physiological activity, and scope of enabling disclosure must therefore be wider than that for inventions involving predictable factors such as mechanical or electrical elements, since practical objective of claimed process is use in vivo as cancer treatment, but specification does not exemplify how to carry out process in vivo or describe specific combination-type molecule, for use as antibody, which would be effective for in vivo application of process, and since specification therefore would not enable one skilled in art to carry out invention commensurate with scope of claimed subject matter.

Case History and Disposition:

Appeal from examiner's final rejection of all claims remaining in patent application (John E. Tarcza, primary examiner).

Patent application of David M. Kranz, Susumu Tonegawa, and Herman N. Eisen, serial no. 666,880, filed Oct. 31, 1984 (process for making a targeted cell susceptible to lysis by cytotoxic T lymphocytes). From examiner's final rejection of all claims remaining in application, applicants appeal. Reversed; application rejected on new grounds pursuant to 37 CFR 1.196(b).

Attorneys:

Patrea L. Pabst, of Kilpatrick & Cody, Atlanta, Ga., for appellants.

Judge:

Before Goldstein, Goolkasian, and Kimlin, examiners-in-chief.

Opinion Text

Opinion By:

Goolkasian, examiner-in-chief.

This is an appeal from the examiner's final rejection of claims 1 through 15 and 19 though 31, which are all the claims remaining in the application.

Claim 1 is illustrative of the invention and reads as follows:

1. A process for making a targeted cell susceptible to lysis by a cytotoxic T lymphocyte comprising attaching an antibody specific for determinants of an antigen specific cytotoxic T lymphocyte receptor to a targeted cell not

having major histo-compatibility complex proteins recognized by the cytotoxic T lymphocyte receptor.
The references relied on by the examiner are:

Smith	4,401,764	Aug. 30, 1983
Kung et al. (Kung)	4,515,893	May 7, 1985
Reinherz et al. (Reinherz)	4,550,036	Oct. 29, 1985

Dennert et al. (Dennert), "Induction And Properties Of Cytotoxic T Cells Specific For Hapten-Coupled Tumor Cells," *Journal Of Immunology,* Vol. 114, No. 6, June 1975, pages 1705 through 1712.
Ertl et al. (Ertl), "Identification of idiotypic receptors on reovirus-specific cytolytic T cells," *Proc. Natl. Acad. Sci. USA,* Vol. 79, 1982, pages 7479 through 7483.
Lancki et al. (Lancki), *Federation Proceedings,* Vol. 43, No. 6, abstract #1419, May 1, 1984, page 1659.
Appellants' invention is directed to a process for making a cell (the target) susceptible to lysis (attack and disintegration) by a cytotoxic T lymphocyte (killer cell) when that lymphocyte does not normally recognize the targeted cell and is ordinarily incapable of destroying the target. Appellants' process involves attaching an antibody to the target cell, which antibody is specific for determinants of certain receptors on the cytotoxic T lymphocyte, such that the lymphocyte will now recognize the target, attach thereto and destroy it. Preferably the process provides that the antibody used is in the form of a dual function molecule which includes a portion which specifically binds to the surface of the targeted cell and a second portion which constitutes the anti-receptor antibody to which the T lymphocyte binds.
Appellants' Brief 1 notes that the practical application of the claimed method is that one can form hybrid molecules which are conjugates of monoclonal antibodies directed against a patient's cytotoxic T lymphocytes (CTL) receptor with molecules which can bind to the surface of target cells, e.g., cancer cells. The hybrid molecules may be injected into the patient. In the absence of these molecules, the patient's own cytotoxic T lymphocytes would not destroy the cancer cells. However, the hybrid molecules bind to the target cancer cells and activate the patient's own CTLs which attach to the antibody portion of the molecule and destroy the targeted cancer cells.
All of appellants' claims stand rejected under 35 U.S.C. 103 over either Lancki or Ertl in view of Dennert. The examiner notes that both Lancki and Ertl teach that antibodies to a CTL antigen receptor will be recognized by the CTL which will consequently lyse any cell to which the antibody is bound. It is the examiner's position that having this knowledge, one of ordinary skill in the art would have considered it obvious to attach such an antibody to any cell one wished to kill.
We have carefully reviewed the references relied on by the examiner but are in agreement with appellants that the teachings therein would not have made the claimed subject matter obvious to one of ordinary skill in the art. The Lancki reference simply teaches that T lymphocytes will not only lyse target cells bearing the proper alloantigen but will also lyse a hybridoma cell line which does not express the proper alloantigen but which instead expresses a surface Ig reactive with an antigen receptor on the T lymphocyte. There is simply no suggestion in the Lancki reference that this knowledge should be utilized to modify unrecognizable cells by the addition thereto of an antibody reactive with an antigen receptor on the lymphocyte

cell. There is clearly no suggestion regarding how this can be done.
The Dennert reference does not add to the teachings of Lancki. Dennert does teach that a cell may be modified by associating a hapten therewith and that the modified cell will *in some instances* be attacked by CTL cells. Nevertheless, Dennert indicates that there is an inconsistency in the overall capability of the CTL cells to lyse the hapten treated cells. For example, TNP-coupled chicken erythrocytes were readily lysed by CTL cells whereas

TNP-coupled tumor cells were not lysed to an extent greater than the uncoupled tumor cells unless special inducement procedures were used. In any event, the Dennert reference contains no suggestion of coupling cells with an antibody to make the cells susceptible to lysing by CTL cells.

The Ertl reference has teachings therein similar to Lancki regarding the ability of T lymphocytes to lyse noninfected target cells which express an anti-idiotypic antibody directed against an antibody (termed G-5) which recognized certain neutralization epitopes for the virus. Ertl teaches that this anti-idiotypic surface Ig can mimic real virus determinants and can be recognized by CTL cells. Ertl has no suggestion that this observed phenomenon be utilized to the extent that antibodies recognized by the CTL cells be attached to a targeted cell so that the CTL cell will recognize and lyse the target itself. As indicated previously, the Dennert reference does not add this necessary teaching.

[1] Obviousness is tested by what the combined teachings of the references would have suggested to one of ordinary skill in the art. *In re Keller,* 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). Before obviousness may be established, the examiner must show that there is either a suggestion in the art to produce the claimed invention or a compelling motivation based on sound scientific principles. See *Carl Schenck A.G. v. The Nortron Corp.,* 713 F.2d 782, 218 USPQ 698, 702 (Fed. Cir. 1983). Logic compels that the suggestion or motivation be accompanied by a general knowledge of the existence of art recognized techniques for carrying out the proposed invention.

In the case before us, the examiner has noted certain phenomena observed by those working in the art. However, the observations are not only devoid of any suggestion to put the phenomena to practical use but also devoid of advice regarding how to accomplish the necessary "attaching" procedure of appellants' claims. A *prima facie* case of obviousness has not been established. We reverse the rejection under 35 U.S.C. 103.

Pursuant to 37 CFR 1.196(b) we make the following rejection. Claims 1 through 15 and 19 through 31 are rejected under 35 U.S.C. 112, first paragraph, as based upon a disclosure which would not have enabled a person of ordinary skill in the art to carry out the claimed process at the time the instant application was filed. *In re Glass,* 492 F.2d 1228, 1232, 181 USPQ 31, 34 (CCPA 1974).

[2] Appellants' invention is directed to a process which involves physiological activity. The disclosure requirements are controlled by the precepts set forth in *In re Fisher,* 57 CCPA 1099, 427 F.2d 833, 839, 166 USPQ 18, 24 (1970). As stated therein:

... requires that the scope of the claims must bear a reasonable correlation to the scope of enablement provided by the specification to persons of ordinary skill in the art. In cases involving predictable factors, such as mechanical or electrical elements, a single embodiment provides broad enablement in the sense that, once imagined, other embodiments can be made without difficulty and their performance characteristics predicted by resort to known scientific laws. In cases involving unpredictable factors, such as most chemical reactions and *physiological activity,* the scope of enablement obviously varies inversely with the degree of unpredictability of the factors involved. (Emphasis added)

In the present case, appellants' specification (page 8) and Brief (page 13) clearly indicate that the claimed process has as its practical objective a use *in vivo,* specifically against cancer cells as the targets. None of the work depicted in the specification is directed to *in vivo* experimentation. Moreover, the only method of attaching the antibody to the target cells which is exemplified or described as effective in the specification is crosslinking the antibody to the cell surface using glutaraldehyde as the crosslinking agent. This technique is clearly unavailable for use *in vivo.* Appellants' have proposed a method of attaching the antibody to the target cell *in vivo* which involves coupling the antibody with a second molecule that will bind to the surface of the targeted cell. It is well known, however, that the human body has many mechanisms therein which are specifically designed to prevent the intrusion of strange molecules and foreign substances into the organism. Among such defense mechanisms are antibodies which combine with and inactivate molecules 2 and

enzymes which tend to break up and, consequently, inactivate molecules. Assuming, arguendo, one were to prepare and inject the necessary coupling compound, there is no predictability that the coupling would ever reach the target cell or upon reaching the target cell be in a form such that it will combine as predicted. Appellants have provided no guidance regarding which conjugates will reach the target effectively.

We note the warning of the Supreme Court in *Brenner v. Manson,* 383 U.S. 519, 148 USPQ 689, 695 (1966) to the effect that a process patent in a chemical field which has not been developed creates a monopoly of knowledge which should be granted only if clearly commanded by the statute. This is because such patents may engross unknown and perhaps unknowable areas and may confer power "to block off whole areas of scientific development, without compensating benefit to the public." See also the discussion in *Monsanto Chemical Co. v. Coe,* U.S.App.D.C., 145 F.2d 18, 21-24, 62 USPQ 37 (1944).

We have considered the general unpredictability of the field in which appellants' invention is said to be of practical concern (anti-cancer treatment). We have also noted that appellants have not exemplified how to carry out the claimed invention *in vivo* and, indeed, have not exemplified a specific combination type molecule of the type claimed in claim 6 which would be effective in an *in vivo* application of the process. We are satisfied that the specification does not teach and would not enable one of ordinary skill in the art to carry out the invention commensurate with the scope of the claimed subject matter.

The examiner's rejection of claims 1 through 15 and 19 through 31 under 35 U.S.C. 103 is reversed. A new ground of rejection has been made under 35 U.S.C. 112, first paragraph, pursuant to 37 CFR 1.196(b).

Effective August 20, 1989, 37 CFR 1.196(b) has been amended to provide that a new ground of rejection pursuant to the rule is not considered final for the purpose of judicial review under 35 U.S.C. 141 or 145.

Any request for reconsideration or modification of this decision by the Board of Patent Appeals and Interferences based upon the same record must be filed within one month from the date of the decision (37 C.F.R. 1.197).

Should appellant elect to have further prosecution before the examiner in response to the new rejection under 37 C.F.R. 1.196(b) by way of amendment or showing of facts, or both, not previously of record, a shortened statutory period for making such response is hereby set to expire two months from the date of this decision.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR 1.136(a). See the final rule notice, 54 F.R. 29548 (July 13, 1989), 1105 O.G. 5 (August 1, 1989).

REVERSED

Footnotes

Footnote 1. Page 13.

Footnote 2. As evidence thereof we attach hereto a copy of page 90 of the text *Biochemistry,* Second Edition, by Geoffrey Zubay (1988) which indicates that vertebrates contain major defense systems against invading foreign substances.

- End of Case -

bases upon which the claimed invention and the British reference could have been distinguished besides the way the signals are maintained separate and apart. QSound cites *Conroy v. Reebok Int'l, Ltd.*, 14 F.3d 1570, 1576, 29 USPQ2d 1373, 1378 (Fed.Cir. 1994) in support. That case has no application here. In *Conroy*, the district court granted summary judgment of non-infringement, purportedly using the "hypothetical claim" analysis under *Wilson Sporting Goods Co. v. David Geoffrey & Assoc.*, 904 F.2d 677, 14 USPQ2d 1942 (Fed.Cir.1990), simply upon finding one of the elements of the accused device in the prior art. *See Conroy*, 14 F.3d at 1577, 29 USPQ2d at 1378. We held that that was improper because it failed to consider whether the prior art would render the "hypothetical claim" invalid. *See id.* In the case at bar, the district court did not merely find the accused structure in the prior art. Instead, it held that the applicants affirmatively distinguished their claimed invention from that in the prior art. This is a classic case of prosecution history estoppel. The fact that the British reference could have been distinguished, standing alone, on different grounds is immaterial. *See Southwall*, 54 F.3d at 1583, 34 USPQ2d at 1682 ("[A]ny argument made regarding the need to distinguish the prior art ... does create a separate estoppel, regardless of other distinctions made." (citation omitted)). Accordingly, summary judgment of non-infringement under the doctrine of equivalents was proper. The public has a right to rely on the assertions made by a patent applicant to secure allowance of its claims. Post-hoc, litigation-inspired argument cannot be used to reclaim subject matter that the public record in the PTO clearly shows has been abandoned.

CONCLUSION

Accordingly, the summary judgment of non-infringement is

AFFIRMED.

USPQ2d at 1100 (applying prosecution history estoppel to claims in a patent from related application).

C.R. BARD, INC., Plaintiff–Appellant,

v.

M3 SYSTEMS, INC., Defendant–Appellee.

No. 96–1165.

United States Court of Appeals, Federal Circuit.

Sept. 30, 1998.

Holder of reissue patent and original patent for "gun" devices used to take samples of body tissue for biopsy purposes brought infringement action against competitor. Competitor raised defenses that patents were invalid and not infringed, and also charged patent holder with fraud, antitrust law violation, and patent misuse. The United States District Court for the Northern District of Illinois, Elaine E. Bucklo, J., entered judgment upon jury verdict for competitor, and patent holder appealed. The Court of Appeals, Pauline Newman, Circuit Judge, held that: (1) reissue patent was not anticipated or obvious; (2) reissue patent was not invalid for incorrect inventorship; (3) reissue patent was not invalid for alleged violation of reissue requirements; (4) original patent was supported by written description; (5) original patent was not invalid as anticipated or obvious; (6) original patent was not infringed; (7) patent holder did not engage in fraud; (8) antitrust liability could not be based on fraud in procurement of patent or allegation of "sham" litigation; (9) finding of patent misuse was not supported by evidence; and, in opinions by Mayer, Chief Judge, and Bryson, Circuit Judge, held that: (10) reissue patent was invalid under statutory on-sale bar; and in opinion by Bryson, Circuit Judge, held that: (11) patent holder's modification of its device to exclude others' replacement needles constituted antitrust violation.

Affirmed in part, reversed in part, vacated in part, and remanded.

Pauline Newman, Circuit Judge, noted her partial dissent.

Mayer, Chief Judge, concurred in part, dissented in part, and filed opinion.

Bryson, Circuit Judge, concurred in part, dissented in part, and filed opinion which Mayer, Chief Judge, joined in part.

1. Patents ⇐324.55(3.1)

On review from finding of patent invalidity, the appellate court must decide for itself whether reasonable jurors viewing the evidence as a whole could have found the facts needed to support the verdict in light of the applicable law; appellant must establish that the jury's actual or inferred factual findings were not supported by substantial evidence, or that the found or inferred facts were not sufficient to support the conclusion, or that the law was incorrectly applied.

2. Federal Civil Procedure ⇐2608.1

When a claim or defense cannot be maintained or defeated without a favorable finding on a material issue, and there is not substantial evidence supporting that finding, the verdict cannot stand and the court must render judgment as a matter of law. Fed. Rules Civ.Proc.Rule 50, 28 U.S.C.A.

3. Patents ⇐37

To meet the requirements of patentability a device must be new; that is, it must not have been previously known. 35 U.S.C.A. § 102.

4. Patents ⇐69

When the defense of lack of novelty is based on a printed publication that is asserted to describe the same invention, a finding of anticipation requires that the publication describe all of the elements of the claims, arranged as in the patented device. 35 U.S.C.A. § 102.

5. Patents ⇐101(2)

Term "freely slidable," as used in patent for biopsy gun which claimed "a second needle extending through said hollow first needle and freely slidable therewithin," meant freely slidable in both directions, not just forward direction, so patented gun did not read on prior art needle which could not slide in both directions.

6. Patents ⇐165(4)

Preamble to patent claim may limit the scope of the claim, when patentability depends on limitations stated in the preamble or when the preamble contributes to the definition of the claimed invention, but, where preamble simply states the intended use or purpose of the invention, preamble usually does not limit the scope of the claim unless the preamble provides antecedents for ensuing claim terms and limits the claim accordingly.

7. Patents ⇐165(1)

Reference to "housing" of tissue sampling device, in preamble of patent claim, did not establish that claim was anticipated by failing to distinguish gun device from prior art, as question of anticipation related only to device's needles, not device itself.

8. Patents ⇐51(2)

Although the on-sale bar precluding patentability can arise from one's own invention, "anticipation" does not arise from sale of one's own invention. 35 U.S.C.A. § 102(a, b).

9. Patents ⇐66(1.25)

Patent for needles used in biopsy gun was not anticipated by prior art, in view of differences between patented needles and prior art. 35 U.S.C.A. § 102.

10. Patents ⇐16(1), 314(5)

Patent invalidity based on obviousness is a question of law based on underlying facts; relevant facts relate to (1) the scope and content of the prior art, (2) the level of ordinary skill in the field of the invention, (3) the differences between the claimed invention and the prior art, and (4) any objective evidence of nonobviousness such as long felt need, commercial success, the failure of others, or copying. 35 U.S.C.A. § 103.

11. Patents ⇐314(5)

The ultimate determination of obviousness or nonobviousness of patent is a legal conclusion. 35 U.S.C.A. § 103.

12. Patents ⇐16.17

When a patent describes a new mechanical device that can be viewed as a new combination or arrangement of mechanical components, the legal conclusion of obviousness requires that there be some suggestion, motivation, or teaching in the prior art whereby the person of ordinary skill would have selected the components that the inventor selected and used them to make the new device. 35 U.S.C.A. § 103.

13. Patents ⇐324.55(4)

Court of Appeals reviews a jury verdict of obviousness to determine whether substantial evidence supports the factual findings predicate to the legal conclusion of obviousness and whether such findings can support the verdict, with appropriate consideration of the presumption of validity and the requirement that obviousness be proved by clear and convincing evidence; factual inferences are drawn and credibility determinations are accepted in favor of the verdict winner. 35 U.S.C.A. § 103.

14. Patents ⇐16.17

Patented needle assembly in biopsy gun was not obvious absent any prior art providing a teaching or suggestion or motivation that a needle assembly should be made with the structure shown and claimed in the patent.

15. Patents ⇐324.55(4)

Patent inventorship is a question of law, applied to relevant facts; findings of relevant fact are reviewed on the standard appropriate to the trier of fact, while the application of law to the found or admitted facts is reviewed on appeal without deference to the trier of fact.

16. Patents ⇐90(1)

The "inventor" is the person or persons who conceived the patented invention; thus, facts relevant to inventorship are those showing the conception of the invention, for others may provide services in perfecting the invention conceived by another without becoming an "inventor" by operation of law.

See publication Words and Phrases for other judicial constructions and definitions.

17. Patents ⇐91(1)

An assertion of incorrect inventorship in patent must be based on facts proved by clear and convincing, corroborated evidence.

18. Patents ⇐91(4)

Competitor failed to establish, by clear and convincing evidence, that omitted individual was inventor of claimed needle assembly for biopsy gun, and patent was thus not invalid for incorrect inventorship. 35 U.S.C.A. § 256.

19. Patents ⇐90(1)

To invalidate a patent based on incorrect inventorship it must be shown not only that the inventorship was incorrect, but that correction is unavailable. 35 U.S.C.A. § 256.

20. Patents ⇐136

A petition to correct inventorship of patent may be filed during reissue proceedings. 37 C.F.R. § 1.324.

21. Patents ⇐138(1), 141(4)

Error in failing to claim needles in earlier patent for biopsy gun was amenable to correction by reissue, and correction of error was timely because it occurred within requisite two-year time period. 35 U.S.C.A. § 251; 37 C.F.R. § 1.175.

22. Patents ⇐136

An inventor's failure to appreciate the scope of an invention at the time of the original patent grant, and thus an initial intent not to claim the omitted subject matter, is a remediable error.

23. Patents ⇐167(1)

Claims of patent for biopsy gun which required sequential energizing means for

moving first and second needles were supported by the description contained in the specification, as claims, properly construed, permitted some overlap in energizing step in accordance with specification.

24. Patents ⇐53, 61

Patent for biopsy gun was not invalid based on anticipation, as neither published Patent Cooperation Treaty (PCT) application nor earlier version of gun showed integrated mechanical energizing structure described in patent claims, as properly construed. 35 U.S.C.A. § 102.

25. Patents ⇐16.17

Patent for biopsy gun was not invalid as obvious, notwithstanding earlier versions of guns, absent any reference suggesting structure or various features employed in patented gun, or teaching of combination of descriptions of earlier versions. 35 U.S.C.A. § 103.

26. Patents ⇐323.3

Patentee would be entitled to a new trial on infringement, due to improper claim construction at trial, if a jury reasonably could have reached verdicts of infringement upon correct claim construction and correct application of the law of infringement; however, if only one result is supportable in law and on undisputed facts, judgment as a matter of law is appropriate.

27. Patents ⇐235(2)

Patent for biopsy gun with structure using rotational tensioning as the energizing means, pursuant to means-plus-function claim, was not infringed by accused device which performed function of sequential energizing, as required by patent, but did not have equivalent structure since it did not contain "guide sleeve" and used linear tensioning rather than counter-rotational tensioning. 35 U.S.C.A. § 112.

28. Patents ⇐314(5)

The determination of patent infringement under means-plus-function statute is a factual question. 35 U.S.C.A. § 112.

29. Patents ⇐237

To be found infringing under means-plus-function statute, the accused equivalent structure need not have been known at the time the patented invention was made. 35 U.S.C.A. § 112.

30. Patents ⇐157(1)

Claims must be interpreted the same way for determining infringement as was done to sustain their validity.

31. Patents ⇐97

Fraud in the procurement of a patent requires proof of the elements of fraud as developed in the common law: (1) that a false representation of a material fact was made, (2) with the intent to deceive, (3) which induced the deceived party to act in justifiable reliance on the misrepresentation, and (4) which caused injury that would not otherwise have occurred.

32. Fraud ⇐4.5, 20

The tort of fraud requires that there was a successful deception, and action taken by the person deceived that would not have otherwise been taken.

33. Patents ⇐97

Applied to patent prosecution, tort of fraud requires (1) a false representation or deliberate omission of a fact material to patentability, (2) made with the intent to deceive the patent examiner, (3) on which the examiner justifiably relied in granting the patent, and (4) but for which misrepresentation or deliberate omission the patent would not have been granted.

34. Monopolies ⇐12(15)

Patents ⇐97

A finding of fraud can of itself render the patent unenforceable, and when accompanied by the elements of violation of the Sherman Act, can incur additional consequences. Sherman Act, § 1 et seq., as amended, 15 U.S.C.A. § 1 et seq.

35. Monopolies ⇐12(15)

To establish fraud for purposes of antitrust violation, the patent infringement de-

fendant must make a greater showing of scienter and materiality than when seeking unenforceability based on conduct before the Patent Office.

36. Patents ⇐97

Alleged misrepresentations and omissions made by patent applicant in procurement of patents for biopsy guns did not amount to fraud, as there was no showing of deceptive intent, some allegedly omitted evidence was cumulative, and there was no evidence that applicant withheld or misrepresented prior art.

37. Fraud ⇐36

Good faith is an absolute defense to the charge of common law fraud.

38. Patents ⇐97

There is no presumption that information not filed by a patent applicant was material, for purpose of fraud claim, simply because patentability ensued; rather, to establish culpability, any omission must be of a fact material to patentability and it must be a deliberate misrepresentation, whether by omission or misstatement, that was intended to and did mislead the examiner into taking favorable action that would not otherwise have been taken.

39. Patents ⇐97

Intent to mislead or to deceive Patent Office must be proved by clear and convincing evidence, and deceptive intent is not inferred simply because information was in existence that was not presented to the examiner.

40. Monopolies ⇐12(15)

On claim alleging antitrust violation based on use of fraudulently obtained patent to restrain competition, restraint on competition based on power in the relevant market must be established on the criteria of the Sherman Act's antimonopoly provision. Sherman Act, § 2, as amended, 15 U.S.C.A. § 2.

41. Monopolies ⇐12(15)

It is not presumed that the patent-based right to exclude necessarily establishes market power in antitrust terms; unless the patent had been obtained by fraud such that the market position had been gained illegally, the patent right to exclude does not constitute monopoly power prohibited by the Sherman Act. Sherman Act, § 2, as amended, 15 U.S.C.A. § 2.

42. Monopolies ⇐12(15)

Finding of antitrust liability could not be based on use of fraudulently obtained patent to restrain competition, where jury's findings of fraud were not supported by substantial evidence. Sherman Act, § 2, as amended, 15 U.S.C.A. § 2.

43. Monopolies ⇐12(15)

Conduct prohibited under antitrust law includes bringing suit to enforce a patent with knowledge that the patent is invalid or not infringed, and the litigation is conducted for anti-competitive purposes.

44. Monopolies ⇐12(16.5)

Although sham litigation as a tactic to destroy competition can lead to antitrust violation, sham litigation requires more than a failed legal theory.

45. Monopolies ⇐12(15, 16.5)

Neither the bringing of an unsuccessful suit to enforce patent rights, nor the effort to enforce a patent that falls to invalidity, subjects the suitor to antitrust liability.

46. Monopolies ⇐12(15)

The law recognizes a presumption that the assertion of a duly granted patent is made in good faith, for purpose of antitrust claim against patentee, and this presumption is overcome only by affirmative evidence of bad faith.

47. Monopolies ⇐12(15, 16.5)

Patentee's infringement action did not amount to "sham" litigation that would support antitrust liability, as only evidence that action was sham was testimony of engineer that he did not think that alleged infringer's original product infringed patent and that

other employees had told him that alleged infringer changed its design to one that did not infringe, where engineer also testified that he did not know whether those who told him accused device did not infringe had ever read patent, or whether they were familiar with concept of infringement under the doctrine of equivalents.

48. Patents ⇐283(1)

The defense of patent misuse arises from the equitable doctrine of unclean hands, and relates generally to the use of patent rights to obtain or to coerce an unfair commercial advantage; patent misuse relates primarily to a patentee's actions that affect competition in unpatented goods or that otherwise extend the economic effect beyond the scope of the patent grant.

49. Patents ⇐283(1)

Patent misuse is viewed as a broader wrong than antitrust violation because of the economic power that may be derived from the patentee's right to exclude; thus, misuse may arise when the conditions of antitrust violation are not met.

50. Patents ⇐283(1)

The key inquiry on claim of patent misuse is whether, by imposing conditions that derive their force from the patent, the patentee has impermissibly broadened the scope of the patent grant with anticompetitive effect.

51. Patents ⇐283(1)

Patent misuse arises in equity, and a holding of misuse renders the patent unenforceable until the misuse is purged; it does not, of itself, invalidate the patent.

52. Patents ⇐324.55(1)

When a jury has determined that patent misuse occurred, Court of Appeals reviews the underlying findings of fact for support by substantial evidence, presuming that the jury resolved any factual disputes in favor of the verdict winner, and Court then determines whether, on the found or presumed facts, the conclusion on the issue of misuse is correct.

53. Patents ⇐283(1)

Although the defense of patent misuse indeed evolved to protect against "wrongful" use of patents, the catalog of practices labelled "patent misuse" does not include a general notion of "wrongful" use.

54. Patents ⇐324.55(1)

Jury's finding that holder of patent for biopsy gun engaged in patent misuse was not supported by evidence, absent evidence that patent holder's competitive activities were either per se patent misuse or that they were not reasonably within the patent grant.

Opinion of Mayer, Chief Judge, concurring in part and dissenting in part.

55. Patents ⇐81

Reissue patent for biopsy gun was invalid under statutory on-sale bar based on patentee's activities occurring more than one year prior to filing date of patent's parent application. (Per Mayer, Chief Judge, with one Circuit Judge concurring in the result.) 35 U.S.C.A. § 102(b).

Opinion of Bryson, Circuit Judge, concurring in part and dissenting in part.

56. Monopolies ⇐12(15)

Patent holder's modification of its patented biopsy gun to prevent competitors' non-infringing, flangeless needles from being used in patent holder's guns constituted antitrust violation, based on evidence that patent holder enjoyed monopoly power in market for replacement needles and maintained its monopoly position by exclusionary conduct. (Per Bryson, Circuit Judge, for a majority of the court.)

John F. Sweeney, Morgan & Finnegan, L.L.P., New York City, argued for plaintiff-appellant. With him on the brief were Harry C. Marcus, Desiree M. Stahl, and Walter G. Hanchuk. Of counsel were Warren H. Rotert and Steven F. Meyer.

Richard D. Harris, Law Offices of Dick and Harris, and Paul E. Slater, Sperling, Slater & Spitz, P.C., Chicago, Illinois, argued for defendant-appellee. With them on the brief were Max Shaftal, Jordan A. Sigale, and Jovan N. Jovanovic, Law Offices of Dick and Harris, and Greg Shinall, Sperling, Slater & Spitz, P.C.

Before MAYER, Chief Judge, NEWMAN and BRYSON, Circuit Judges.

Opinion for the court by Judge NEWMAN except for Part I.E (on-sale issue) and Part VI.C (attempt to monopolize). Judge BRYSON does not join Parts I.A–D of Judge NEWMAN'S opinion. The district court's judgment concerning the on-sale bar is affirmed in separate opinions by Chief Judge MAYER and Judge BRYSON. The district court's judgment concerning the attempt to monopolize issue is reversed-in-part by Judge NEWMAN'S opinion (Parts VI.A–B), which Chief Judge MAYER and Judge BRYSON join, and affirmed-in-part by Judge BRYSON'S opinion (Part II), which Chief Judge MAYER joins. Judge NEWMAN dissents with respect to the on-sale bar and attempt to monopolize issues.

PAULINE NEWMAN, Circuit Judge.

In suit are United States Patent No. 4,944,308 issued July 31, 1990 (the '308 patent) and United States Reissue Patent No. RE 34,056 issued September 8, 1992 (the '056 patent), both entitled "Tissue Sampling Device." These patents originated with the work of Dr. Per Gunner Lindgren, a physician in Sweden, and are now owned by appellant C.R. Bard, Inc.

The patented inventions are devices for taking samples of body tissue for biopsy purposes, wherein a biopsy needle firing device or "gun" mechanically injects a biopsy needle assembly into the core body tissue. These devices are described as improving the speed, accuracy, ease, and patient comfort of tissue sampling, compared with manually inserted biopsy needles. They are said to be particularly advantageous for sampling small or movable lesions and fibrous or firm tissues, because the rapidly and firmly fired needles can penetrate even fibrotic lesions before the lesions can slip aside. The patented guns and needles have achieved commercial success.

Bard sued M3 Systems in August 1993 in the United States District Court for the Northern District of Illinois,[1] asserting that M3's ProMag biopsy gun and ACN/SACN biopsy needle assemblies infringed the '308 and '056 patents, respectively. M3 raised the defenses that the patents are invalid on several grounds and are not infringed, and also charged Bard with fraud, antitrust law violation, and patent misuse. The jury rendered special verdicts in favor of M3 on every issue, finding the '056 patent invalid and not infringed on each of the grounds of anticipation, obviousness, violation of a section 102(b) bar, incorrect naming of inventors, and non-compliance with reissue requirements; and finding the '308 patent invalid and not infringed on grounds of anticipation, obviousness, and insufficient written description. The jury also found that Bard perpetrated fraud in the Patent and Trademark Office (PTO) in obtaining both patents, that Bard misused both patents, and that Bard violated antitrust law, awarding $1.5 million in antitrust damages, trebled by the district court.

The district court denied all post-trial motions. This appeal followed. This court affirms the judgment of invalidity of the '056 patent and vacates the judgment of noninfringement of the '056 patent. The judgment of invalidity of the '308 patent is reversed and the judgment of noninfringement is affirmed. The judgments of misuse and fraud are reversed. The judgment of antitrust violation on the ground of attempt to monopolize is affirmed, but the antitrust damages award is vacated, for redetermination upon remand.

THE PATENTED INVENTIONS

The First Generation Device—The PCT Patent Application

In 1981 Dr. Lindgren, working in Sweden with Jan Allard, an engineer, designed and

1. *C.R. Bard, Inc. v. M3 Sys., Inc.*, No. 93–CV–4788 (N.D. Ill. Oct. 2 & Dec. 20, 1995) (orders).

constructed the first of several successively improved mechanical biopsy guns. This "first generation" gun was designed to fire a commercially available biopsy needle assembly made by the Baxter Travenol Company, having the brand name "Tru–Cut." The Tru–Cut is a double needle consisting of a hollow outer needle called the cannula and an inner needle called the stylet. The stylet is solid except for a recess near its point. In the manual procedure for which the Tru–Cut was designed, the physician would first extend the stylet and insert the assembly into the body tissue, whereupon the tissue to be sampled would flow into the recess in the stylet; the physician would then push the cannula into the body tissue to surround the stylet and cut and trap the tissue sample in the recess.

This procedure required the physician to use both hands to manipulate the needles, while a second physician would hold and manipulate the ultrasound equipment that is usually required to view the interior of the body and direct insertion of the needles. Dr. Lindgren sought to mechanize this procedure in order to improve the speed and accuracy of insertion, to reduce human error, and to permit a physician to perform the biopsy without assistance by providing a sampling device that can be operated with one hand while the other hand holds the ultrasound apparatus.

The first generation gun is a box-like structure fitted with two spring-loaded drivers associated with slots that are configured to hold the cannula and stylet of the Tru–Cut needle assembly. To use this gun the physician must first "cock" each of the spring-loaded drivers. This cocking action, as it was often called at trial, is referred to as pretensioning or energizing in the patent documents. Cocking is performed by hand or with a specially designed tool described as a miniature crowbar. After the drivers are cocked, the stylet and cannula are placed in the appropriate slots and the gun housing is closed. The gun is then aimed at the target tissue and a trigger mechanism releases the stylet and cannula in rapid sequence. The needles are then manually retrieved.

Dr. Lindgren and Mr. Allard filed a patent application on the first generation gun under the Patent Cooperation Treaty (PCT). The invention was assigned to Radiplast AB, a small Swedish company associated with Dr. Lindgren. The PCT application was filed on March 31, 1982 and was published on October 13, 1983. It is prior art to the United States patents in suit.

The Second Generation—The '056 Reissue Patent

Starting in 1984, Dr. Lindgren undertook to improve the gun so that it would not be necessary for the physician to cock the two drivers manually before installing the biopsy needles, a step described as awkward and inefficient. In 1985 Dr. Lindgren, working with Dan Åkerfeldt, an engineer, designed a mechanism whereby the drivers are cocked by external action after the needles are placed in the gun and the housing is closed. In this mechanism rods are attached to each of the spring-loaded drivers, extend out the back of the gun, and culminate in a ring or handle. By pulling the ring or handle the operator simultaneously cocks both drivers, moving the needles rearward. A trigger mechanism then fires the stylet and cannula, in rapid sequence, into the tissue to be sampled.

The Tru–Cut needles were not usable with the second generation gun, for their structure was such that they could not be moved rearward as well as propelled forward. New needles were designed with a modified hub and flange structure and a slit in the stylet flange to facilitate placement in the gun. Corresponding structural changes were made to the gun to accommodate the changes in the needles. Radiplast, as assignee, filed a patent application in Sweden on February 19, 1986. The United States application was filed on July 30, 1986, naming Dr. Lindgren as the inventor. Corresponding United States Patent No. 4,699,154 (the '154 patent) was issued on October 13, 1987, with claims to the combination of the second generation gun and the new needle assembly. The '154 patent did not claim the needle assembly alone.

In 1989 Bard, having become Radiplast's distributor in 1987, acquired ownership of the Radiplast patents. Bard applied for reissue of the '154 patent in order to add claims to the needle assembly alone. This reissue patent issued on September 8, 1992, and is the '056 patent in suit. During the reissue proceeding Bard and Dr. Lindgren petitioned the PTO to correct the inventorship to include Dan Åkerfeldt. In addition, Bard described to the PTO various activities of Radiplast in the United States, as shall be discussed in connection with the on-sale issue.

The Third Generation Gun—The '308 Patent

Dan Åkerfeldt continued to work on improving these devices. He sought to make the gun easier to use, especially by inexperienced physicians. Because pulling the cocking ring required significant manual force to overcome the simultaneous resistance of both driver springs, he designed an external integrated cocking mechanism that energized the two springs sequentially, thereby requiring less force than did the simultaneous cocking mechanism of the second generation gun. The third generation gun also provided for separate rearward movement of the needles after the biopsy sample was taken, thereby facilitating removal of the tissue from the stylet. Radiplast applied for a United States patent on the third generation gun on November 14, 1988, naming Dan Åkerfeldt as inventor. The patent issued in 1990 and is the '308 patent in suit.

I

VALIDITY OF THE '056 REISSUE PATENT

[1] Bard charged M3 Systems with infringement of claims 9–12 and 21–23 of the '056 patent. M3 had the burden of establishing invalidity by clear and convincing evidence at trial. *Carella v. Starlight Archery*, 804 F.2d 135, 138, 231 USPQ 644, 646 (Fed.Cir.1986). On review, the appellate court must "decide for ourselves whether reasonable jurors viewing the evidence as a whole could have found the facts needed to support the verdict in light of the applicable law." *Lemelson v. General Mills, Inc.*, 968 F.2d 1202, 1207, 23 USPQ2d 1284, 1288 (Fed. Cir.1992). The appellant must establish that the jury's actual or inferred factual findings were not supported by substantial evidence, or that the found or inferred facts were not sufficient to support the conclusion, or that the law was incorrectly applied. *See, e.g., Applied Med. Resources Corp. v. United States Surgical Corp.*, 147 F.3d 1374, 1376, 47 USPQ2d 1289, 1290 (Fed.Cir.1998); *D.M.I., Inc. v. Deere & Co.*, 802 F.2d 421, 425, 231 USPQ 276, 278 (Fed.Cir.1986).

[2] When a claim or defense can not be maintained or defeated without a favorable finding on a material issue, and there is not substantial evidence supporting that finding, the verdict can not stand and the court must render judgment as a matter of law. *See* Fed.R.Civ.P. 50; *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 251–52, 106 S.Ct. 2505, 91 L.Ed.2d 202 (1986); *see generally Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 975, 34 USPQ2d 1321, 1326 (Fed.Cir.1995) (in banc), *aff'd*, 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577, 38 USPQ2d 1461 (1996). The appellate court must determine whether on the evidence of record a jury might properly have returned a verdict in the non-movant's favor when the correct legal standard is applied. If not, the movant was entitled to have the question removed from the jury and decided as a matter of law.

We apply these principles to each of the grounds on which the jury rendered verdicts of invalidity of the asserted '056 claims. We direct our discussion of validity primarily to claim 21, for the claim is representative and M3 Systems' expert witnesses admitted infringement of claim 21 by M3's original ACN needles:

> **21.** A biopsy needle for use with a tissue sampling device having a housing with a forward end, a first slide mounted for longitudinal motion within said housing, and a second slide mounted for longitudi-

nal motion within said housing, said biopsy needle comprising:

a hollow first needle having proximal and distal ends;

a second needle extending through said hollow first needle and freely slidable therewithin, said second needle having proximal and distal ends;

a first head mounted to said proximal end of said hollow first needle, said first head including first flange means associated therewith for coupling said hollow first needle to said first slide for longitudinal motion both toward and away from said forward end of said housing; and

a second head mounted to said proximal end of said second needle, said second head including second flange means associated therewith for coupling said second needle to said second slide for longitudinal motion both toward and away from said forward end of said housing.

A. Anticipation

[3] To meet the requirements of patentability a device must be new; that is, it must not have been previously known. Section 102(a) requires that the subject matter was not published anywhere, or known or used by others in the United States, before its invention by the patentee.[2] An invention that does not meet the requirements of novelty in section 102(a) is said to be "anticipated."

[4] When the defense of lack of novelty is based on a printed publication that is asserted to describe the same invention, a finding of anticipation requires that the publication describe all of the elements of the claims, arranged as in the patented device. *Shearing v. Iolab Corp.*, 975 F.2d 1541, 1544–45, 24 USPQ2d 1133, 1136 (Fed.Cir.1992); *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed.Cir.1989); *Perkin–Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 894, 221 USPQ 669, 673 (Fed.Cir.1984). The jury found that all of the claims at issue were "fully anticipated by a single prior art reference." Bard states that no reference described the new biopsy needle assembly of the '056 patent, and that the closest prior art, which all agree is the Travenol Tru–Cut needle assembly, differs in material ways. M3 Systems states that the Tru–Cut (or a publication describing the Tru–Cut) anticipated the claimed needle assembly because the '056 claims, correctly construed, read on the Tru–Cut.

The district court declined to construe all of the claim terms that were placed in dispute, instructing the jury that "words in a claim are to be given their ordinary and accustomed meaning, unless it appears that the inventor intended to use them differently.... You may use the specification to interpret what the patentee meant by a word or phrase in a claim." The record shows that the court defined some terms and the parties explained their views to the jury. This procedure was not incorrect at the time this case was tried——for as the court observed, the question of the relative roles of judge and jury was then before the Supreme Court——and does not of itself warrant a new trial. On appellate review, however, we apply the principles of *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454–56, 46 USPQ2d 1169, 1172–75 (Fed.Cir.1998) (in banc), and determine whether on the correct claim construction the jury verdict can stand. *See United States Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568, 41 USPQ2d 1225, 1236 (Fed. Cir.) (reviewing whether the verdict reached was in accordance with correct claim construction), *cert. denied*, —— U.S. ——, 118 S.Ct. 369, 139 L.Ed.2d 287 (1997).

1. The Term "Freely Slidable"

[5] M3 Systems contends that the claim term "freely slidable" does not distinguish

2. § 102. A person shall be entitled to a patent unless—
(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, ...

the '056 claims from the Tru-Cut needle assembly. The term "freely slidable" appears in the following claim clause:

> a second needle extending through said hollow first needle and freely slidable therewithin, . . .

Bard argues that the court should have construed "freely slidable" for the jury, and that correctly construed this term means that the needle slides freely in either direction. M3 responds that Bard improperly seeks to insert the limitation "totally" into the definition of "freely slidable" and that, correctly construed, "freely slidable" requires only sliding freely in the forward direction. M3 states that since the Tru-Cut is freely slidable in the forward direction, the claim reads on the prior art and is invalid for anticipation.

M3 Systems' proposed claim construction is not correct, and could not have reasonably been adopted. The specification leaves no uncertainty that the '056 needles are freely slidable in both directions, for that is a purpose of the new '056 needle structure. M3's proposed interpretation is unsupported by, and indeed is contrary to, the specification. *See Slimfold Mfg. Co. v. Kinkead Indus., Inc.*, 810 F.2d 1113, 1116, 1 USPQ2d 1563, 1566 (Fed.Cir.1987) (claims are not interpreted "in a vacuum," but are read and understood in light of the specification of which they are a part). The jury's finding of anticipation can not be sustained if grounded on M3's interpretation of "freely slidable," for it was not disputed that the prior art Tru-Cut needles can not slide in both directions.

2. The "Housing"

M3 Systems argues that the preamble of the '056 claims refers only to the "housing" of the tissue sampling device, and that the lack of any preamble reference to an external automatic cocking mechanism invalidates the claims by anticipation because they fail to distinguish the gun of the preamble from the prior art first generation gun.

[6] M3 Systems has incorrectly construed the claim preamble. A preamble may serve a variety of purposes, depending on its content. It may limit the scope of the claim, for example when patentability depends on limitations stated in the preamble, as in *In re Stencel*, 828 F.2d 751, 754, 4 USPQ2d 1071, 1073 (Fed.Cir.1987), or when the preamble contributes to the definition of the claimed invention, as in *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55 F.3d 615, 620, 34 USPQ2d 1816, 1820 (Fed.Cir.1995). In this case, however, the preamble simply states the intended use or purpose of the invention, as in *Loctite Corp. v. Ultraseal Ltd.*, 781 F.2d 861, 868, 228 USPQ 90, 94 (Fed.Cir.1985). Such a preamble usually does not limit the scope of the claim unless the preamble provides antecedents for ensuing claim terms and limits the claim accordingly. In *Vaupel Textilmaschinen KG v. Meccanica Euro Italia S.P.A.*, 944 F.2d 870, 880, 20 USPQ2d 1045, 1053 (Fed.Cir.1991), for example, the preamble described a "reference point" that provided guidance in understanding and construing the claim.

[7] In the case at bar, the preamble of claim 21 recites the portion and structure of the gun housing into which the needles fit, and provides reference points in the gun that aid in defining the needles as set forth in the body of the claim. M3 Systems is incorrect in stating that the preamble must contain details of the integrated mechanical cocking structure, for the gun structure is not part of the separate claims to the needles. The question of anticipation of the '056 claims relates to the needles, not the gun. To the extent that the jury verdicts of anticipation may have been based on M3's incorrect construction of the preamble, they can not be sustained. On the correct construction of the preamble, it contributes no basis of invalidity on the ground of anticipation.

3. The On-sale Bar and "Anticipation"

[8] M3 Systems defends these anticipation verdicts by arguing that the asserted claims are anticipated because they are subject to an on-sale bar. Although 35 U.S.C.

§ 102(b) provides that an inventor's sales or offers of sale more than one year before the patent filing date may bar the grant of a valid patent,[3] the on-sale bar is an independent ground of invalidity based on the inventor's delay in entering into the patent system. Although the on-sale bar can arise from one's own invention, "anticipation" does not arise from sale of one's own invention. We discuss the on-sale issue *post;* however, this aspect is unrelated to the "anticipation" verdicts, was not part of the jury instruction on that issue, and is not based on correct law.

Conclusion

[9] In sum, M3 Systems directs us to no prior art or prior knowledge or use by others that constitutes substantial evidence of anticipation of the needles claimed in the '056 patent. M3's witnesses conceded that the '056 needles differ from the Tru–Cut in the flange structure for coupling to the gun for movement both toward and away from the housing, a structure that limits all claims, as well as in the additional limitation in claims 10 and 12 of a slit in the stylet head flange. It is not disputed that the Tru–Cut needle assembly lacks these elements. In view of these admitted differences between the '056 needles and the prior art, differences unambiguously stated in the '056 claims, the verdicts of anticipation are unsupported by substantial evidence. The judgment of invalidity on this ground is reversed.

B. Obviousness

[10] Invalidity based on obviousness is a question of law based on underlying facts. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18, 86 S.Ct. 684, 15 L.Ed.2d 545, 148 USPQ 459, 467 (1966); *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1566–68, 1 USPQ2d 1593, 1595–97 (Fed.Cir.1987). The relevant facts relate to (1) the scope and content of the prior art, (2) the level of ordinary skill in the field of the invention, (3) the differences between the claimed invention and the prior art, and (4) any objective evidence of nonobviousness such as long felt need, commercial success, the failure of others, or copying. *Graham*, 383 U.S. at 17, 86 S.Ct. 684, 148 USPQ at 467; *see Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1270, 20 USPQ2d 1746, 1750–51 (Fed. Cir.1991).

[11–13] The ultimate determination of obviousness *vel non* is a legal conclusion. *See Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 297 n. 24, 227 USPQ 657, 667 n. 24 (Fed.Cir.1985). When a patent describes a new mechanical device that can be viewed as a new combination or arrangement of mechanical components, the legal conclusion of obviousness requires that there be some suggestion, motivation, or teaching in the prior art whereby the person of ordinary skill would have selected the components that the inventor selected and used them to make the new device. *See Heidelberger Druckmaschinen AG v. Hantscho Commercial Prods., Inc.*, 21 F.3d 1068, 1072, 30 USPQ2d 1377, 1379 (Fed. Cir.1994) ("When the patented invention is made by combining known components to achieve a new system, the prior art must provide a suggestion or motivation to make such a combination."); *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 934, 15 USPQ2d 1321, 1323 (Fed.Cir.1990) (it is insufficient that prior art shows similar components, unless it also contains some teaching, suggestion, or incentive for arriving at the claimed structure). We review a jury verdict of obviousness to determine whether substantial evidence supports the factual findings predicate to the legal conclusion of obviousness and whether such findings can support the verdict, with appropriate consideration of the presumption of validity and the requirement that obviousness be proved by clear and convincing evidence; factual in-

3. § 102 A person shall be entitled to a patent unless—
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, ...

ferences are drawn and credibility determinations are accepted in favor of the verdict winner. *See Richardson-Vicks Inc. v. Upjohn Co.*, 122 F.3d 1476, 1480, 44 USPQ2d 1181, 1183–84 (Fed.Cir.1997); *Structural Rubber Prod. Co. v. Park Rubber Co.*, 749 F.2d 707, 718–19, 223 USPQ 1264, 1273 (Fed. Cir.1984).

[14] M3 Systems argued at trial that the patented needle assembly would have been obvious in light of the Tru-Cut needle assembly, and that the only differences arose from obvious adaptations to accommodate the new gun design and to provide the desired reverse movement of the needles. No other prior art was presented. The invention that was made, however, does not make itself obvious; that suggestion or teaching must come from the prior art. *See, e.g., Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1051–52, 5 USPQ2d 1434, 1438 (Fed.Cir.1988) (it is impermissible to reconstruct the claimed invention from selected pieces of prior art absent some suggestion, teaching, or motivation in the prior art to do so); *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed.Cir.1985) (it is insufficient to select from the prior art the separate components of the inventor's combination, using the blueprint supplied by the inventor); *Fromson v. Advance Offset Plate, Inc.*, 755 F.2d 1549, 1556, 225 USPQ 26, 31 (Fed.Cir.1985) (the prior art must suggest to one of ordinary skill in the art the desirability of the claimed combination).

No prior art provided a teaching or suggestion or motivation that a needle assembly should be made with the structure shown and claimed in the '056 patent. Absent this essential evidentiary component of an obviousness holding, as a matter of law the verdicts of invalidity on that ground can not stand. Consequently, the judgment of invalidity based on obviousness is reversed.

C. Inventorship

[15] The jury rendered special verdicts of invalidity of the asserted '056 claims on the ground of incorrect inventorship. Inventorship is a question of law, applied to relevant facts. Findings of relevant fact are reviewed on the standard appropriate to the trier of fact, in this case for substantial evidence. *See Hess v. Advanced Cardiovascular Sys., Inc.*, 106 F.3d 976, 980, 41 USPQ2d 1782, 1786 (Fed.Cir.), *cert. denied*, —— U.S. ——, 117 S.Ct. 2459, 138 L.Ed.2d 216 (1997). The application of law to the found or admitted facts is reviewed on appeal without deference to the trier of fact. *See Ethicon, Inc. v. United States Surgical Corp.*, 135 F.3d 1456, 1460, 45 USPQ2d 1545, 1547 (Fed.Cir.1998); *Sewall v. Walters*, 21 F.3d 411, 415, 30 USPQ2d 1356, 1358 (Fed.Cir.1994).

[16] The "inventor," in patent law, is the person or persons who conceived the patented invention. *Collar Co. v. Van Dusen*, 90 U.S. (23 Wall.) 530, 563–64, 23 L.Ed. 128 (1874); *Burroughs Wellcome Co. v. Barr Lab., Inc.*, 40 F.3d 1223, 1227–28, 32 USPQ2d 1915, 1919 (Fed.Cir.1994) ("Conception is the touchstone of inventorship.") Thus facts relevant to inventorship are those showing the conception of the invention, for others may provide services in perfecting the invention conceived by another without becoming an "inventor" by operation of law. *Id.; Agawam Co. v. Jordan*, 74 U.S. (7 Wall.) 583, 602–04, 19 L.Ed. 177 (1868); *Hess*, 106 F.3d at 980–81, 41 USPQ2d at 1786–87. As explained in *Shatterproof Glass Corp. v. Libbey-Owens Ford Co.*, 758 F.2d 613, 624, 225 USPQ 634, 641 (Fed.Cir.1985), "an inventor may use the services, ideas, and aid of others in the process of perfecting his invention without losing his right to a patent."

[17] An assertion of incorrect inventorship must be based on facts proved by clear and convincing, corroborated evidence. *Hess*, 106 F.3d at 980, 41 USPQ2d at 1786. The difficulty of determining legal inventorship has been recognized, *see Jamesbury Corp. v. United States*, 207 Ct.Cl. 516, 518 F.2d 1384, 1396, 183 USPQ 484, 489 (Ct.Cl. 1975) (inventorship is one of the most difficult issues in American patent law) and, to avoid inadvertent invalidity, 35 U.S.C. § 256 permits correction of the designated inven-

torship of a patent when an error was made without deceptive intent:

> § 256 Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without any deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate correcting such error.

See Stark v. Advanced Magnetics, Inc., 119 F.3d 1551, 1556, 43 USPQ2d 1321, 1325 (Fed. Cir.1997) (error in inventorship may be corrected at any time if no deceptive intent).

[18] The '154 patent as filed in the United States had named Dr. Lindgren as sole inventor. In the course of the reissue proceeding Dr. Lindgren filed a petition in the PTO to add Dan Åkerfeldt as a joint inventor. Lindgren and Åkerfeldt each filed declarations explaining their roles in the invention and declaring that the omission in naming Åkerfeldt was due to differences between United States and Swedish patent law, and was not done with intent to deceive.

M3 Systems challenged the joint inventorship of Lindgren and Åkerfeldt, and also stated that neither one was an inventor of the '056 patent's needles, but that Alan Taylor, President of Hart Enterprises, the company Radiplast retained to manufacture its new needles in the United States, was the sole inventor. Although Mr. Taylor did not appear at the trial, he stated in a deposition that he was not an inventor, but that he suggested the slot in the stylet flange to cooperate with a guide pin in the gun and prevent rotation of the needle. He said he sketched his design for Mr. Engström, although such a sketch was not produced. M3 states that Mr. Taylor gave written notice of his claim in 1990, before the reissue application was filed, but the record citations in M3's brief do not direct us to such notice.

It has long been the rule that one who asserts "inventor" status must provide clear and convincing evidence of supporting facts, including corroborating evidence. *See Woodland Trust v. Flowertree Nursery, Inc.*, 148 F.3d 1368, 1371, 47 USPQ2d 1363, 1366 (Fed. Cir.1998) (illustrating the historical distrust of uncorroborated oral testimony of prior invention and citing the "rule of reason" analysis of corroborating evidence in *Price v. Symsek*, 988 F.2d 1187, 1194, 26 USPQ2d 1031, 1036 (Fed.Cir.1993)). At the trial Mr. Engström disputed Mr. Taylor's statements, and the earliest depiction introduced of the flange with a slot was a Swedish document.

[19] Alternatively, M3 Systems points to the design patents that were filed in the name of Åkerfeldt alone, as establishing that Dr. Lindgren was not a joint inventor of the needles with Åkerfeldt. Bard replies, and there is no dispute, that the design patents showed specific hub designs not shown in the utility patent. Whether Åkerfeldt was the sole inventor of specific hub designs does not negate his joint inventorship of the needles of the '056 patent, which are depicted and claimed broadly. Bard also stresses that if indeed there were error in inventorship, such errors are correctable and do not invalidate the patent absent deceptive intent. To invalidate a patent based on incorrect inventorship it must be shown not only that the inventorship was incorrect, but that correction is unavailable under section 256:

> § 256 [¶ 2] The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred if it can be corrected as provided in this section....

Although M3 contends that deceptive intent can be inferred from the omission of Taylor as an inventor, precedent requires that one who claims a share of inventorship must establish that right by clear and convincing evidence. *Ethicon*, 135 F.3d at 1465–66, 45 USPQ2d at 1552; *Hess*, 106 F.3d at 980, 41 USPQ2d at 1785–86. Since such evidence was absent, the judgment of invalidity based on incorrect inventorship can not stand, and is reversed.

D. Violation of Reissue Requirements

The jury also found by special verdicts that the asserted '056 claims were invalid on

the ground that the reissue requirements were not met. M3 Systems explains in its brief that the jury found that "any purported error in the '154 patent could *not* be corrected by reissue," explaining that the errors were the error in inventorship and the error in failing to claim the needles in the original '154 patent.

[20] With respect to the argument that the correction of inventorship was improperly made by reissue, we have been directed to no legal or procedural error, for the prosecution history clearly shows that the error in inventorship was described in the reissue application and corrected by appropriate petition, filed and processed while the reissue application was pending. A petition to correct inventorship, 37 C.F.R. § 1.324 (1991), may be filed during reissue proceedings. The error in inventorship was corrected before the reissue patent was granted, and thus the reissued patent names Lindgren and Åkerfeldt as the inventors. This procedure can not have provided ground for a reasonable jury's verdicts of invalidity based on violation of reissue requirements.

[21] The other aspect that M3 Systems argued was not amenable to correction by reissue was the addition of claims to the needles per se. That argument incorrectly states the reissue law, for a primary purpose of the reissue statute is to enable the addition of claims to subject matter not claimed in the original patent. *See Scripps Clinic & Res. Found'n v. Genentech, Inc.*, 927 F.2d 1565, 1575, 18 USPQ2d 1001, 1009 (Fed.Cir. 1991) (purpose of reissue statute is to avoid forfeiture of substantive rights due to erroneously claiming less than entitled, through error without intent to deceive); *In re Wilder*, 736 F.2d 1516, 1518–19, 222 USPQ 369, 371–72 (Fed.Cir.1984) (purpose of reissue is to correct errors such as misunderstanding scope of the invention and claiming less than that to which the inventor was entitled).

[22] M3 Systems states that since the needles were not claimed originally they were not "intended" to be claimed, and that absence of such intent is not an error correctable by reissue. That too is an incorrect statement of the law. An inventor's failure to appreciate the scope of an invention at the time of the original patent grant, and thus an initial intent not to claim the omitted subject matter, is a remediable error. *See In re Amos*, 953 F.2d 613, 619, 21 USPQ2d 1271, 1276 (Fed.Cir.1991) (reissue application not subject to rejection for failure to demonstrate initial intent to claim, when subject matter of reissue claims satisfies § 112 requirements); *In re Weiler*, 790 F.2d 1576, 1581, 229 USPQ 673, 676–77 (Fed.Cir.1986) ("intent to claim" is shorthand for a means of measuring whether required error is present); *In re Hounsfield*, 699 F.2d 1320, 1322, 216 USPQ 1045, 1048 (Fed.Cir.1983) (lack of "intent to claim" is only one factor to be considered).

M3 Systems also argues that the error in failing to claim the needles should have been corrected sooner. The reissue statute sets a two-year time limit for filing a broadening reissue application. This requirement was met. *See* 35 U.S.C. § 251; *In re Graff*, 111 F.3d 874, 877, 42 USPQ2d 1471, 1473–74 (Fed.Cir.1997) (broadened claims must be filed within two years); *see also* 37 C.F.R. § 1.175 (1991). There is no requirement that a patentee act earlier rather than later during the two-year window established by statute.

M3 Systems has stated no basis in fact or law for its assertion that any reissue procedure was violated. The verdicts of invalidity on this ground are unsupported in law, and judgment based thereon is reversed.

E. The On-Sale Issue [4]

The jury also found that the asserted '056 claims were invalid on the ground that the new needle assembly had been "patented or published or in public use or on sale" in the United States more than one year before the

4. This section is the dissenting opinion of Judge Newman. The court affirms the judgment of invalidity for violation of the on-sale bar, in separate opinions of Chief Judge Mayer and Judge Bryson.

filing date of the '154 patent application in the United States. *See* 35 U.S.C. § 102(b), *supra* note 3. Since that filing date was July 30, 1986, the critical date for bar purposes is July 30, 1985.

Although the special verdicts did not distinguish among the statutory grounds of patented or published or in public use or on sale, the major focus at trial and on appeal is the issue of on sale. While M3 Systems also argued that there was a bar based on publication and public use, the only evidence referred to relates to the first generation gun and the Tru–Cut needles, which are acknowledged prior art and are not claimed in the patents in suit. M3's argument at trial that these prior art devices were also a bar to the '056 claims under section 102(b) is not pressed on appeal.

The '154 and '056 patents are directed to the second generation gun and new needles. Before the critical date, indeed before the development of the second generation gun and new needles had been completed, Radiplast was engaged in a variety of activities directed to the United States market. These activities included demonstrating and promoting the first generation gun with the Tru–Cut needles, pursuing arrangements for clinical trials for the second generation gun and new needles through collaboration with a potential United States distributor, applying for FDA approval, arranging for manufacture of the needles in the United States, and related activities directed to commercial goals. Although Radiplast's final needle design was developed after the critical date, the issue at trial was the effect of these prior activities under the law of section 102(b).

Federal Circuit precedent on the on-sale bar requires consideration by the court of the totality of the circumstances in light of the various policies that underlie the bar. Precedent explains that "while a wide variety of factors may influence the on sale determination, no single one controls the application of section 102(b), for the ultimate conclusion depends on the totality of the circumstances." *Ferag AG v. Quipp, Inc.*, 45 F.3d 1562, 1566, 33 USPQ2d 1512, 1514 (Fed.Cir. 1995); *see Envirotech Corp. v. Westech Eng'g Inc.*, 904 F.2d 1571, 1574, 15 USPQ2d 1230, 1232 (Fed.Cir.1990).

Although a few cases have recognized the advantages of a bright line rule that would be applicable in all cases, that is, a defining event whereby an inventor will know when the bar will accrue, generally the court has undertaken to weigh the particular facts of the commercial activity against the particular policy considerations that apply to the situation, giving effect to the principle that "the policies or purposes underlying the on sale bar, in effect, define it." *RCA Corp. v. Data General Corp.*, 887 F.2d 1056, 1062, 12 USPQ2d 1449, 1454 (Fed.Cir.1989). Thus, in general, "this court has been careful to avoid erecting rigid standards for 102(b)." *Western Marine Elecs., Inc. v. Furuno Elec. Co.*, 764 F.2d 840, 844, 226 USPQ 334, 337 (Fed. Cir.1985); *see Petrolite Corp. v. Baker Hughes, Inc.*, 96 F.3d 1423, 1425, 40 USPQ2d 1201, 1203 (Fed.Cir.1996) ("This court has emphasized that the totality of the circumstances must be considered in determining whether a particular event creates an on-sale or public use bar." (quoting *U.S. Environmental Prods., Inc. v. Westall*, 911 F.2d 713, 716, 15 USPQ2d 1898, 1901 (Fed.Cir.1990))).

The determination of whether a product was on sale in terms of section 102(b) is a question of law. *See Micro Chem., Inc. v. Great Plains Chem. Co.*, 103 F.3d 1538, 1544, 41 USPQ2d 1238, 1243–44 (Fed.Cir.1997) (discussing precedent and applying the totality of the circumstances standard as a matter of law); *KeyStone Retaining Wall Sys., Inc. v. Westrock, Inc.*, 997 F.2d 1444, 1451, 27 USPQ2d 1297, 1303 (Fed.Cir.1993) (explaining relevant factual inquiries); *Baker Oil Tools, Inc. v. Geo Vann, Inc.*, 828 F.2d 1558, 1562–64, 4 USPQ2d 1210, 1213–14 (Fed.Cir. 1987) (discussing various factors to be weighed in context of experimental testing by third persons).

The various policy considerations include the policy of providing a limited but normally sufficient time (one-year) for the inventor to

test the commercial reception of the invention before deciding whether it warrants patenting; the policy of limiting the period during which the patentee may delay entering into the patent system for the purpose of deferring the end of the period of patent-based exclusivity; the policy favoring prompt public disclosure of inventions through the patent system; and the policy of recognizing the practical consideration whereby the value of an invention may not be known until it is publicly tested. Depending on the dominant policy considerations in the particular case, applied to the factual circumstances of that case, the Federal Circuit has reached a variety of conclusions as to when the on-sale bar arose. The court's precedent illustrates rulings ranging from the requirement that the patented product was produced and available commercially before the on-sale bar started to accrue, to rulings that the bar was triggered before the invention had been completed.

Before the critical date for the '056 patent, July 30, 1985, three sets of events were explored at trial. The facts are not in dispute; the question is whether, as a matter of law, the on-sale bar arose in these circumstances:

1. The Clinical Trials

The clinical trials were arranged by American Pharmaseal, Radiplast's potential distributor in the United States, and were conducted in August and September 1985 (after the critical date) using the second generation guns and new needles. In January 1985 Thomas Engström of Radiplast had quoted to Pharmaseal the price for 12 guns and 500 needles for use in the trials. Pharmaseal later that spring requested 10 guns and 250 needles, for which Radiplast sent an invoice in June 1985. Mr. Engström testified that this payment was to defray some of Radiplast's costs in providing these devices, and was so understood. It was not disputed that the transaction produced no profit for Radiplast.

M3 Systems asserts that Radiplast sold the 10 guns and 250 needles to Pharmaseal, pointing out that a standard sales invoice was used. Bard replies that this was a transaction between collaborators, not a commercial sale and not a sale for commercial distribution. Dr. Lindgren testified that he visited the four United States hospitals that were testing the device (after the critical date), to explain its use and to see how it worked in different tissues, operated by different doctors. Bard stresses that the devices were not sold, that all but one were returned by the hospitals after the clinical trials, and unused needles were destroyed.

Generally cost defrayal arrangements between collaborators are not deemed to be invalidating sales, nor are payments for use substantially for test purposes. *See In re Mahurkar*, 71 F.3d 1573, 1577, 37 USPQ2d 1138, 1142 (Fed.Cir.1995) (actual sale of two prototype catheters "did not place the invention in the public domain or lead the public to believe that the device was freely available"); *Ethicon, Inc. v. United States Surgical Corp.*, 762 F.Supp. 480, 506–07, 19 USPQ2d 1721, 1740 (D.Conn.1991) (clinical tests by surgeon not a public use under § 102(b)), *aff'd*, 965 F.2d 1065 (Fed.Cir.1992) (Table); *Baker Oil Tools*, 828 F.2d at 1564, 4 USPQ2d at 1214 (discussing factors in deciding whether the purpose of testing was primarily experimental). In its submissions to the PTO during the reissue proceeding Radiplast characterized the transaction concerning the 10 guns and 250 needles as for experimental purposes.

It is not disputed that the sole purpose of this transaction was to make the devices available to the four selected hospitals for a limited test period. Radiplast's arrangement with Pharmaseal for payment or defrayal of the cost of providing the devices was not a sale or offer of sale as contemplated by section 102(b). It contravenes none of the policies underlying the on sale bar for Radiplast to have recouped these costs. Upon considering the totality of the circumstances, I conclude that an on-sale bar did not arise based on this transaction between Radiplast and Pharmaseal in connection with the clinical trials.

2. The Bulk Price Quotation

In January 1985 Radiplast quoted to Pharmaseal prices for various bulk quantities of up to 50,000 needles. At that time the new needles were still being modified, and the record shows that design changes were made well after January 1985. Mr. Engström of Radiplast testified that the quotation was information for a potential distributor, in the event that Pharmaseal accepted that role (it did not). The bulk price quotations were in a telex that stated, "This is to give you an indication of the price levels. We have to meet and discuss more in detail all things related with the marketing of our biopsy instrument in US." It was not disputed that the quotation was for modified needles, and that both parties understood that the modified needles were not yet available.

M3 Systems argues that since the first generation device had been shown to operate for its intended purpose using Tru–Cut needles, the inventor had already convinced himself that he had a satisfactory product that he wished to commercialize in the United States, and thus that the bulk price quotation, even if for needles not yet developed, was an on-sale event. M3 stresses that the price quoted for bulk quantities included a profit for Radiplast, unlike the price for the clinical trial quantities.

Quotation of a sales price to a potential distributor of a product that is not available for sale and distribution does not of itself establish an on-sale bar. *See Continental Can*, 948 F.2d at 1270, 20 USPQ2d at 1750 (price terms set between collaborators in joint research not an on-sale bar); *Shatterproof Glass*, 758 F.2d at 622, 225 USPQ at 639 ("clear weight of authority is that a bare offer to sell does not ipso facto satisfy the 'on sale' bar"). A primary policy served by the on-sale bar is to provide time for an inventor to determine the reception of his invention in the marketplace before entering into the patent system, while the one-year limit prevents undue lengthening of the period of exclusivity. The policy is served when cognizance is taken of whether the invention is ready for commercial use at the time that customer contacts are made. Although exceptions have arisen on particular facts, normally the on-sale bar does not accrue based on customer contacts made while the product is still being developed or tested. *See KeyStone*, 997 F.2d at 1451, 27 USPQ2d at 1303 (on-sale bar "requires that the device asserted to be on sale was operable"); *Seal–Flex Inc. v. Athletic Track & Court Constr.*, 98 F.3d 1318, 1322, 40 USPQ2d 1450, 1452 (Fed.Cir. 1996) (invention not completed if it required testing under conditions of actual use).

In this case, the circumstances of the incomplete stage of development of the second generation gun and proposed new needles at the time of this price quotation, the potential but not established distributor relationship underlying this quotation, the planned clinical collaboration, and the non-existence of a completed final product, negate the accrual of an on-sale bar from this price quotation. It seems clear that neither Radiplast nor Pharmaseal expected that this bulk price quotation would be followed by the placement of an order. To satisfy the on-sale requirement of section 102(b) there must be more than an informational exchange of price information, when there is no reasonable contemplation that the quotation will be followed by purchase and sale as a commercial transaction.

I conclude that the verdicts of invalidity based on the on-sale bar can not be supported by this bulk price quotation.

3. The Correspondence with Dr. Phelps

The third event raised by M3 Systems occurred in November 1984. Mr. Engström of Radiplast responded to a letter written in September 1984 by Dr. Phelps, a physician in Alabama, who had seen a demonstration and brochure for the first generation device and wrote to Sweden for information. Engström wrote back that he hoped to start marketing a second generation device and new needles in the United States in early 1985, and that if Dr. Phelps did not wish to wait until United States distribution was arranged he could

order directly from Sweden; the letter quoted prices for a gun and needles. No further correspondence ensued. Dr. Phelps testified that he expected that had he sent an order it would have been filled, and that he knew nothing about the difference between "generations." Mr. Engström testified that neither the new needles nor the completed second generation gun was available when he answered Dr. Phelps.

An offer of sale originating in a foreign country, directed to a consumer in the United States, can establish an on-sale bar as to what was offered. *In re Caveney*, 761 F.2d 671, 676–77, 226 USPQ 1, 4 (Fed.Cir.1985). The demonstration and brochure that led to Dr. Phelps' inquiry were of the first generation device, which used Tru-Cut needles. Although the details of Radiplast's product changes were not explained to Dr. Phelps it was undisputed that an order, if placed, could not have been filled at that time with the second generation gun and needles. *Cf. King Instrument Corp. v. Otari Corp.*, 767 F.2d 853, 860, 226 USPQ 402, 407 (Fed.Cir. 1985) (finding it significant that purchaser could discern that it was the later-patented invention being offered for sale).

At the time of Mr. Engström's letter the second generation device and needles were in an early development stage. Although Dr. Phelps was not told the details of these developments, this correspondence did not raise an on-sale bar to a product not yet developed. As held in *Robotic Vision Sys., Inc. v. View Eng'g, Inc.*, 112 F.3d 1163, 1167–68, 42 USPQ2d 1619, 1623 (Fed.Cir.1997), "subsequent completion of an invention after the critical date does not relate back to the date of an earlier alleged offer of sale." *See also Micro Chem.*, 103 F.3d at 1544–45, 41 USPQ2d at 1243 (no on-sale bar when invention not completed at time of offer, only prototype and sketch of proposed configuration); *Shatterproof Glass*, 758 F.2d at 622, 225 USPQ at 639 (not an on-sale bar to solicit orders before invention completed); *cf. Pfaff v. Wells Elecs., Inc.*, 124 F.3d 1429, 43 USPQ2d 1928 (Fed.Cir.1997), *cert. granted*, — U.S. ——, 118 S.Ct. 1183, 140 L.Ed.2d 315 (1998) (No. 97–1130) (although invention not reduced to practice because no physical embodiment had been made, the firm purchase order and delivery date accrued the on-sale bar) (citing *UMC Elecs. Co. v. United States*, 816 F.2d 647, 2 USPQ2d 1465 (Fed.Cir.1987)). On the totality of the circumstances, considering the relevant policies and the undisputed facts, I conclude that this letter to Dr. Phelps, written in response to an inquiry about the first generation device, which resulted from a brochure on the first generation device, stating the price for the second generation device and needles before they were fully developed and before they were available, did not trigger the on-sale bar.

Upon *de novo* review of the totality of the circumstances, with due consideration to the applicable policies, the undisputed facts, and drawing factual inferences in favor of the verdicts, I conclude that the verdicts of invalidity based on a section 102(b) bar are incorrect; I would reverse the judgment on that ground.[5]

II

INFRINGEMENT OF THE '056 PATENT

In view of the majority's affirmance of the judgment of invalidity, we do not reach the issue of infringement of the '056 patent. That judgment is vacated.

5. The three different views in the three opinions of this panel on the on-sale issue point up the need for a more certain law than today exists. Inventors and those who commercialize inventions should reasonably know when the on-sale bar starts to accrue, instead of awaiting litigation-borne *post hoc* judicial evaluations of the totality of the circumstances, varying with the nature of the invention, the nature of the customer contact, and the judicial weight given to the conflicting policy interests.

I favor, as simple and fair, the bright line rule that for the § 102(b) on-sale bar to accrue the invention must exist in commercial form when the offer of sale is made. This rule would implement the dominant policy of providing a one-year grace period for determining the performance of the product in the marketplace.

III

VALIDITY OF THE '308 PATENT

The '308 patent is directed to the third generation gun. The jury found the asserted claims of the '308 patent not infringed, and invalid or unenforceable on the grounds of anticipation, obviousness, and insufficient supporting description, as well as for fraud, misuse, and violation of antitrust law, as discussed in Parts V–VII, *post.*

Claims 15 and 16 were at issue, with emphasis added to show the claim terms whose construction is relevant to the issues of patent validity or infringement:

15. A tissue sampling device comprising:

a guide sleeve having front and rear guide sleeve ends and defining a longitudinal axis extending between said front and rear guide sleeve ends, said front guide sleeve end having an opening therethrough;

a hollow first needle positioned within said guide sleeve and extendable from said opening, said hollow first needle being moveable along said axis;

a second needle extending through said hollow first needle and moveable along said axis, said second needle having a tip which is extendable from said hollow first needle and said opening, and said second needle further including a tissue sample receiving recess;

a first needle head coupled to said hollow first needle and *mounted within said guide sleeve* for movement along said axis to move said hollow first needle along said axis;

a second needle head coupled to said second needle and *mounted within said guide sleeve* for movement along said axis to move said second needle along said axis;

a first spring *disposed within said guide sleeve* and operatively associated with said second needle head, said first spring being capable of being placed into an energized mode to store energy, and said first spring being releasable from said energized mode to propel said second needle head along said axis towards said opening, such that said tip of said second needle is extended from said hollow first needle, whereby a tissue sample can be captured within said recess;

a second spring *positioned within said guide sleeve* and operatively associated with said first needle head, said second spring being capable of being placed into an energized mode to store energy, and said second spring being releasable from said energized mode to propel said first needle head along said axis towards said opening, said hollow first needle being extended from said opening such that said recess of said second needle is enclosed by said hollow first needle;

a first latch means selectively releasable from outside said guide sleeve for releasably holding said first spring in said energized mode;

a second latch means for releasably holding said second spring in said energized mode, said second latch means being releasable in response to and subsequent to release of said first spring; and

sequential energizing means operative to move said first needle head along said axis towards said rear guide sleeve end to cause said second latch means to hold said second spring in said energized mode, *and subsequently to move said second needle head* along said axis towards said rear guide sleeve end to cause said first latch means to hold said first spring in said energized mode.

Claim 16 is the same as claim 15 except for the last clause, which includes the selective retraction of the stylet to expose the tissue sample:

16..... *energizing means operative to move said first needle head and said second needle head* along said axis towards said rear guide sleeve end to cause said first latch means to hold said first spring in said energized mode and to cause said

second latch means to hold said second spring in said energized mode, said energizing means being selectively operative to move said first needle head but not said second needle head towards said rear guide sleeve end, whereby said hollow first needle is selectively retractable to expose said tissue sample receiving means in said second needle.

A. Support by the Written Description

[23] The jury found claims 15 and 16 "not supported by the description contained in the specification." M3 Systems explains that the issue was the meaning of the claim terms "sequential energizing" and "energizing means." The district court had permitted the jury to resolve this disputed issue of claim construction. On this appeal we give *de novo* review to the issues relevant to the construction and interpretation of the claims. *See Cybor*, 138 F.3d at 1454–56, 46 USPQ2d at 1172–75.

M3 Systems states that "sequential" should be construed, and was construed by the jury, to permit no overlap of needle movement during the energizing step. M3 states that since the patent shows that the second needle can start to move before the first needle has completed its movement, the written description does not support the claims. M3 states, as it did at trial, that since the specification does not describe how to obtain elimination of all overlap of needle movement, the claims are not supported by the written description and are invalid.

Bard agrees that the specification shows a slight overlap in the movement of the needles, whereby the second needle starts to move just before the first needle has completed its movement and the first spring latches. Thus, Bard contends, correct interpretation of the claims allows for this slight overlap in needle movement. Bard states that it is incorrect to construe the claims contrary to the specification, and then to hold the claims invalid because they are contrary to the specification. Bard is of course correct; the claims are construed in accordance with the rest of the specification of which they are a part, and not contrary to it. *See Slimfold Mfg.*, 810 F.2d at 1116, 1 USPQ2d at 1566; *SRI Int'l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1125, 227 USPQ 577, 585 (Fed.Cir.1985) (in banc).

The specification illustrates the sequential energizing of the needles as having some overlap in movement of the needles. The term "sequential" in the claims is in accordance with this description in the specification; no usage or exemplification of the sequential movement requires eliminating all overlap. It is incorrect to construe the claims as barring all overlap, as urged by M3 Systems. On the correct claim construction, no reasonable jury could have found that the claims are not supported by the description in the specification. It is thus apparent that the jury either adopted M3's erroneous claim construction, or incorrectly applied the law governing claim construction to the undisputed facts of the structure described in the specification.

On the correct claim construction the written description is in accordance with and in support of the claims. The judgment of invalidity on this ground is reversed.

B. Anticipation

[24] The jury also found claims 15 and 16 invalid based on anticipation. "Anticipation" requires that the identical invention was already known to others, that is, that the claimed invention is not new. *See Minnesota Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1572, 24 USPQ2d 1321, 1332 (Fed.Cir.1992) ("In order to anticipate, the [reference] must sufficiently describe the claimed invention to have placed the public in possession of it.") M3 Systems argued that anticipation arose on the published PCT application describing the first generation biopsy gun, and on the device itself. It was not disputed, however, that the first generation gun lacks the integrated mechanical energizing structure described and claimed in the '308 patent, and that the PCT application does not show such structure.

M3 Systems' argument was that when the claims are correctly construed they are anticipated. M3 states that on the claim construction reached by the jury in finding claims 15 and 16 unsupported by the written description, whereby the term "sequential" is defined as barring all overlap in needle movement, the structure in the specification is inconsistent with the claims and therefore must be disregarded. M3 argues, as we understand it, that since "energizing means" and "sequential energizing means" are in means-plus-function form, it is appropriate to disregard the structure in the specification that is inconsistent with the claim language, leaving the claimed functions with "*no* disclosed supporting structure," quoting from M3's brief. Thus, according to M3, these claim terms are directed only to function, and can be anticipated by any prior art that shows the function of energizing or sequential energizing, without limit to how that function is performed. Thus M3 argues that since the PCT application and the first generation gun are manually sequentially energized, one spring at a time, the jury correctly found anticipation by the first generation gun and the PCT application.

Indeed, the jury verdicts can be understood only if one adopts so tortured a view of the law. As we have discussed, it is incorrect to construe claims contrary to the specification, and it is incorrect to construe terms in means-plus-function form as disembodied from the structure in the specification. M3 Systems' witnesses readily admitted that the integrated mechanized gun described and claimed in the '308 patent is different from the first generation gun and the description of that gun in the PCT application. On the undisputed facts and the correct law, a reasonable jury could not have found the '308 claims anticipated thereby. The judgment of invalidity for anticipation must be reversed.

C. Obviousness

[25] M3 Systems argues that the third generation gun of the '308 patent would have been obvious in view of the PCT application and the first generation gun, in combination with the '154 patent describing the second generation gun. M3 states that the third generation is an obvious combination of elements found in the first and second generations. See discussion, Part I.B. *ante*, of the law of obviousness. There was no dispute as to the scope and content of this prior art, or as to the elements in the third generation gun that were not in either the first or second generations. The only dispute was the ultimate question of whether the third generation gun would have been obvious from what had gone before.

M3 Systems contends that for the third generation the inventor simply changed the integrated mechanical cocking mechanism of the second generation gun to accomplish mechanically the sequential cocking that was necessarily done when the first generation gun was manually cocked, one spring at a time. Bard replies that the one-at-a-time cocking of the springs in the first generation, by hand or by miniature crowbar, does not teach or suggest the integrated automatic sequential cocking of the third generation, and that there is no teaching or suggestion in the prior art to make such a combination, or of the structure having the improved ease of handling of the third generation gun. Bard also points to the other new structural features of the third generation whereby the needles can be retracted separately after tissue sampling.

The ultimate question is whether, from the evidence of the prior art and the knowledge generally available to one of ordinary skill in the relevant art, there was in the prior art an appropriate teaching, suggestion, or motivation to combine components in the way that was done by the inventor. *See, e.g., Uniroyal*, 837 F.2d at 1050, 5 USPQ2d at 1438; *ACS Hosp. Sys., Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed.Cir. 1984). The ultimate determination of obviousness is a legal conclusion. When this legal conclusion is drawn by the jury the verdict is reviewed, as discussed in Part I.B, to determine whether substantial evidence supports the factual findings necessary to support the legal conclusion, with due consid-

eration to the presumption of validity and the standard of proof.

Bard points out that its rotating sleeve mechanism for sequential energizing is a marked distinction from its earlier devices, even were the concept of sequential energizing deemed to be derivable from the manual operation of the first generation. M3 Systems does not cite any reference suggesting the structure employed in the third generation gun, or any suggestion of mechanical sequential energizing, or indeed the other features of the third generation. Those contributions came from the inventor, not the prior art. *See Uniroyal*, 837 F.2d at 1050, 5 USPQ2d at 1438. We have been directed to no teaching or suggestion of this combination in the descriptions of the first and second generation guns, viewed separately or together. Thus the verdicts of invalidity on the ground of obviousness are without essential factual support, and can not stand.

IV

INFRINGEMENT OF THE '308 PATENT

[26] The jury found that M3 Systems did not infringe claims 15 and 16 of the '308 patent. Because the special verdicts discussed in Part III.A (that there is not support for these claims in the written description) require an incorrect claim construction, we have reviewed the verdicts of noninfringement on the correct construction, *i.e.*, that claims 15 and 16 do not require a total absence of overlap in the sequential movement of the needles during energizing. Bard contends that on the correct claim construction the verdicts of noninfringement can not stand. Bard is entitled to a new trial if a jury reasonably could have reached verdicts of infringement upon correct claim construction and correct application of the law of infringement. However, if only one result is supportable in law and on undisputed facts, judgment as a matter of law is appropriate. *See Strattec*, 126 F.3d at 1419, 44 USPQ2d at 1036.

[27] On appeal Bard argues only the issue of sequential energizing, asserting literal infringement under section 112 paragraph 6. M3 Systems does not dispute, and indeed emphasizes, that in its ProMag devices there is sequential energizing with a slight overlap in needle movement. However, M3's performance of the function of sequential energizing was not the only disputed issue with respect to infringement. M3 also points out that its device is a box-type biopsy gun and does not contain a "guide sleeve" as required by the claims, and that the M3 ProMag guns use linear tensioning whereas the '308 device performs counter-rotational tensioning, such that the structure used by M3 is not equivalent to that shown in the '308 specification, applying section 112 paragraph 6 to the energizing means of the '308 claims.

M3 Systems states that the '308 patent draws a distinction between box-type biopsy guns such as those made by M3 wherein the housing is merely a container for the device, and guns embodying a mechanism wherein the guide sleeve and a tensioning sleeve interact and serve as part of the cocking mechanism. M3 argued at trial that its housing is independent, whereas in the '308 specification the gun is housed in a two-part structure wherein the inner part is the guide sleeve and the outer part is the tensioning sleeve and rotates about the inner part. These sleeves bear cam surfaces and slots that interact with the flanges on the needle heads and thus serve as part of the cocking mechanism. M3 states that its gun has neither a guide sleeve nor a tensioning sleeve, and that its housing is merely the container for the device, and is unconnected with the cocking mechanism.

Although the claims in suit do not require a tensioning sleeve, *see D.M.I., Inc. v. Deere & Co.*, 755 F.2d 1570, 1574, 225 USPQ 236, 239 (Fed.Cir.1985) (improper to import limitation from one claim into another claim lacking the limitation), the guide sleeve is described in the specification as "the inner sleeve or guide sleeve." The specification shows and the claims require that the guide sleeve perform a guiding function for the cocking mechanism. Bard does not assert that such a structure is found in the M3

guns. Nor does Bard raise on this appeal any issue of equivalency under the doctrine of equivalents.

[28] At the trial the parties presented evidence on how the patented and accused devices worked, and the court instructed the jury as to the applicable law of infringement of means-plus-function claims. For the energizing means Bard was required to establish, by a preponderance of evidence, that M3 Systems' device embodies the structure described in the '308 specification or an equivalent thereof. 35 U.S.C. § 112 ¶ 6; *Valmont Indus., Inc. v. Reinke Mfg. Co.*, 983 F.2d 1039, 1041–42, 25 USPQ2d 1451, 1453–54 (Fed.Cir.1993); *Texas Instruments, Inc. v. United States Int'l Trade Comm'n*, 805 F.2d 1558, 1562–63, 231 USPQ 833, 834–35 (Fed. Cir.1986). Since the structure of the M3 energizing means is not the same as that described in the '308 specification, the issue was whether the structures are equivalent. *See D.M.I.*, 755 F.2d at 1575, 225 USPQ at 239 ("[T]he sole question is whether the single means in the accused device which performs the function stated in the claim is the same as or an equivalent of the corresponding structure described in the patentee's specification as performing that function.") The determination of infringement under section 112 paragraph 6 is a factual question. *In re Hayes Microcomputer Prods. Inc. Patent Litig.*, 982 F.2d 1527, 1541, 25 USPQ2d 1241, 1251 (Fed.Cir.1992); *Intel Corp. v. United States Int'l Trade Comm'n*, 946 F.2d 821, 841, 20 USPQ2d 1161, 1178 (Fed.Cir. 1991); *D.M.I., supra.*

[29] There was no dispute that the function of sequential energizing is performed in the M3 Systems' guns; the only question was whether the M3 guns employ the same or an equivalent of the structure described in the '308 specification. The accused equivalent structure need not have been known at the time the patented invention was made. *See Texas Instruments*, 805 F.2d at 1563–64, 231 USPQ at 834–35 ("It is not required that those skilled in the art knew, at the time the patent application was filed, of the asserted equivalent means of performing the claimed functions....")

[30] It was explained at trial that to achieve sequential energizing in the '308 device the outer tensioning sleeve is rotated about the inner guide sleeve; cam surfaces on the interior of the tensioning sleeve push against wings built directly into the needle heads to compress the two springs in sequence, pressing them rearward into the locked position. In contrast, in the M3 Systems device a handle connected through the rear of the housing acts on sleds bearing the needles; M3's device relies on the lever-action of the handle, as opposed to a rotating sleeve, to pull, rather than push, the needle sleds sequentially back toward their respective latches. Bard had argued at trial, in connection with the issue of validity, that the claims "must be interpreted as means-plus-function terms in accordance with *Valmont*," and cited its "external integrated energizing mechanism that converts rotary motion to linear motion" to distinguish the '308 gun from its own earlier device. Claims must be interpreted the same way for determining infringement as was done to sustain their validity.

A reasonable jury could have found that the structure using rotational tensioning as the energizing means is substantially different from the energizing structure in the M3 Systems guns. Although Bard argues that it suffices for infringement if the energizing is achieved with the slight overlap shown in the '308 patent, that is, if the function of sequential energizing is performed, claims written in the form authorized by section 112 paragraph 6 are limited by the structure described and equivalents of that structure. Performance of the same function does not of itself establish infringement.

Bard directs us to the doctrine of claim differentiation, and argues that it is incorrect to interpret the "sequential energizing means" of claim 15 as limited to the structure in the specification, because other claims, not at issue, specifically state that structure. Bard argues that its claims in suit are broad-

er in that they state only the function of sequential energizing, and that they therefore warrant broader scope than the claims that state a specific energizing structure. However, as we have discussed, claims that are written in the form authorized by section 112 paragraph 6 are by statute limited to the structure described in the specification and equivalents of that structure. As discussed in *Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1538, 19 USPQ2d 1367, 1371 (Fed.Cir. 1991) a "means-plus-function limitation is not made open-ended by the presence of another claim specifically claiming the disclosed structure which underlies the means clause or an equivalent of that structure."

Applying this law, and based on the absence of a guide sleeve or any counterpart structure, and the differences in the structures of the energizing mechanisms, we conclude that on the correct claim interpretation a reasonable jury could find that claims 15 and 16 are not infringed. The judgment of noninfringement of the '308 patent is affirmed.

V

FRAUD

M3 Systems charged that Bard had committed both fraud and inequitable conduct in prosecuting the '056 and '308 patents. The jury was not asked to decide the issue of inequitable conduct, which was reserved to the judge and withdrawn by M3 after the favorable verdicts on the question of fraud. The jury found that it had been established by clear and convincing evidence that each of the '056 and the '308 patents had been procured by fraud in the Patent and Trademark Office.

[31] Fraud in the procurement of a patent requires proof of the elements of fraud as developed in the common law: (1) that a false representation of a material fact was made, (2) with the intent to deceive, (3) which induced the deceived party to act in justifiable reliance on the misrepresentation, and (4) which caused injury that would not otherwise have occurred. *See Nobelpharma AB v. Implant Innovations, Inc.*, 141 F.3d 1059, 1069–70, 46 USPQ2d 1097, 1105–06 (Fed.Cir. 1998); *Norton v. Curtiss*, 57 C.C.P.A. 1384, 433 F.2d 779, 792–94 & n. 12, 167 USPQ 532, 543–45 & n. 12 (CCPA 1970) (citing W. Prosser, *Law of Torts* §§ 100–05 (3d ed.1964)).

[32–34] The tort of fraud requires that there was a successful deception, and action taken by the person deceived that would not have otherwise been taken. Applied to patent prosecution, fraud requires (1) a false representation or deliberate omission of a fact material to patentability, (2) made with the intent to deceive the patent examiner, (3) on which the examiner justifiably relied in granting the patent, and (4) but for which misrepresentation or deliberate omission the patent would not have been granted. A finding of fraud can of itself render the patent unenforceable, and when accompanied by the elements of violation of the Sherman Act, as discussed in Part VI, can incur additional consequences.

[35] To establish fraud for purposes of antitrust violation the defendant "must make a greater showing of scienter and materiality" than when seeking unenforceability based on conduct before the Patent Office. 6 Donald S. Chisum, *Chisum on Patents* § 19.03[6][e] (rel. 47 1993) (citations omitted). In *Walker Process Equip., Inc. v. Food Mach. & Chem. Corp.*, 382 U.S. 172, 177, 86 S.Ct. 347, 15 L.Ed.2d 247, 147 USPQ 404, 407 (1965) the Court clarified that "knowing and willful" fraud must be shown, and is predicate to potential antitrust violation. As explained in *Handgards, Inc. v. Ethicon, Inc.*, 601 F.2d 986, 996, 202 USPQ 342, 351 (9th Cir.1979), "[t]he road to the Patent Office is so tortuous and patent litigation is usually so complex, that 'knowing and willful fraud' as the term is used in *Walker* can mean no less than clear, convincing proof of intentional fraud involving affirmative dishonesty, 'a deliberately planned and carefully executed scheme to defraud * * * the Patent Office.' ... Patent fraud cases prior to *Walker* re-

quired a rigorous standard of deceit.... *Walker* requires no less." (Emphasis and elisions in original.) The requirements of common law fraud are in contrast with the broader sweep of "inequitable conduct," an equitable defense that may be satisfied when material information is withheld with the intent to deceive the examiner, whether or not the examiner is shown to have relied thereon. *See Kingsdown Med. Consultants v. Hollister, Inc.*, 863 F.2d 867, 872, 9 USPQ2d 1384, 1389 (Fed.Cir.1988).

[36, 37] M3 Systems stated that Bard made myriad material misrepresentations in prosecuting the '056 and the '308 patents, including the following: the incorrect inventors were named; actual samples of the Tru-Cut needles and the first generation device were not provided to the examiner; the Baxter patent on the Tru-Cut needle and two Lindgren articles on the first generation device were not provided to the examiner; the material submitted to the FDA was not provided to the examiner; the examiner was not told of the co-pending design patents; and the examiner was not provided with all of the evidence on the on-sale issue. Bard responded that there is no substance to any of these assertions; that all material information was presented to the examiner; that there was no intent to deceive the examiner; that the examiner was not deceived; and that the evidence points to good faith in the prosecution of these patents. Good faith is an absolute defense to the charge of common law fraud. *See Walker Process*, 382 U.S. at 177, 86 S.Ct. 347, 147 USPQ at 407.

[38, 39] M3 Systems argues that any omission in the submissions to the PTO is "necessarily material, because the allowance of the application is the intended natural consequence of that submission." That is not a correct statement of the law. There is no presumption that information not filed by an applicant was material simply because patentability ensued. To establish culpability any omission must be of a fact material to patentability and it must be a deliberate misrepresentation, whether by omission or misstatement, that was intended to and did mislead the examiner into taking favorable action that would not otherwise have been taken. Intent to mislead or to deceive must be proved by clear and convincing evidence. *See Walker Process, supra.* Deceptive intent is not inferred simply because information was in existence that was not presented to the examiner; and indeed, it is notable that in the usual course of patent prosecution many choices are made, recognizing the complexity of inventions, the virtually unlimited sources of information, and the burdens of patent examination. *See Northern Telecom*, 908 F.2d at 939, 15 USPQ2d at 1327 (discussing the ease with which routine patent prosecution may be portrayed as tainted conduct).

Following are the actions that M3 Systems presented as probative of fraud in the prosecution of the '056 or the '308 patent:

1. The Inventorship Issue

This issue was discussed *ante* in connection with the validity of the '056 patent. There was no evidence of intent to deceive in correcting the inventorship to include Mr. Åkerfeldt with Dr. Lindgren as joint inventors. The question of Mr. Taylor's role as a possible inventor did not present substantial evidence of fraud. Indeed, since the inventorship issue was not grounds of invalidity, it can not satisfy the "but for" test of fraud.

2. Provision of Actual Models to the Examiner

M3 Systems argued that Bard should have provided the reissue examiner with actual models of the first generation gun and the Tru-Cut needles, in addition to the PCT application and publications describing the needles. The PCT application described the first generation gun, and descriptions of the Tru-Cut needles were before the examiner. Reviewing the prosecution history we do not discern substantial evidence of material withholding, for cumulative information is not material to patentability, and there was no evidence of deceptive intent or that the examiner was deceived into granting the reis-

sue. This issue can not support the verdict of fraud.

3. Provision of On-Sale Information to the Examiner

Bard filed with the PTO descriptions of the transactions involving Radiplast and Pharmaseal before the critical date, accompanied by documents including the invoice for the 10 guns and 250 needles for the clinical trials, the bulk price quotation discussed *ante* in connection with the on-sale issue, and declarations concerning the hospital tests and the proposed distribution relationship between Radiplast and Pharmaseal. M3 Systems states that Bard should have also disclosed to the PTO Radiplast's sales activities for the first generation device, Radiplast's letters to doctors concerning the clinical trials, the fact that the bulk price quotation included a profit, and Radiplast's letter to Dr. Phelps.

Concerning Dr. Phelps, Bard answers that it submitted to the PTO all the relevant material it had obtained. The letter to Dr. Phelps was obtained after suit was filed, during discovery of Radiplast's files in Sweden. There was no evidence that Bard had obtained and withheld this information during the reissue prosecution. With respect to the bulk price quotation, M3 Systems states that Bard should have flagged this document and described its significance to the examiner, lest it be overlooked in the volume of paper. Bard responds that the documents provided to the examiner were a record of Radiplast's efforts to find a distributor and its transactions with Pharmaseal, and that the total number of documents was not so voluminous, or the contents so difficult to understand, as to support an inference of intentional concealment of any particular document that was filed. We agree that these documents, all in the prosecution history, are easily read.[6]

On reviewing these filings in the PTO we have been directed to no evidence of material withholding or the provision of false information, or of intent to deceive or actual deception. The additional subject matter that M3 states should have been included was not shown to be material or other than cumulative. These actions did not constitute substantial evidence of fraud.

4. Disclosure of the Information Filed with the FDA

None of the material provided us with respect to Radiplast's 510(k) pre-market notification filed with the Food & Drug Administration supports a finding of fraud in the patent prosecution. M3 Systems concentrates on the presence in this package of needle drawings made by Hart Enterprises, the designated manufacturer. As we have explained, the inventorship issues that have been raised do not provide substantial evidence of fraudulent procurement of these patents.

5. Disclosure of the PCT Application

The PCT application had been submitted to the PTO during prosecution of the '154 patent and again during the '056 reissue proceedings. M3 Systems states that Bard withheld the PCT application from the examiner of the '308 patent and then mischaracterized it.

M3 Systems stated at trial and repeats on this appeal that Bard submitted the PCT application to the examiner of the '308 patent only after allowance of the '308 claims in suit, and then falsely represented that it was relevant solely to newly added claims 21–23 (as then numbered). Bard complains that M3 misstated at trial, and continues to misstate, these facts. We must agree. The '308 prosecution history in the record shows that Bard cited the PCT application and filed a copy thereof with a Supplemental Information Disclosure Statement accompanying Bard's first response, filed October 13, 1989, to the

6. The record provided us does not show any response from the PTO. Although Bard states that "the [PTO] determined that the transfers to American Pharmaseal [] were for primarily experimental purposes and therefore did not trigger the bar," the record citations do not relate to this statement.

first Office Action. Contrary to M3's statements, the prosecution record shows that no claims had been allowed or held allowable when the PCT application was submitted to the PTO.

In submitting the PCT Application Bard's patent attorney pointed out the aspect of that application that M3 Systems has stated is of greatest significance, *viz.*, the separate and thus sequential hand cocking of the springs in the first generation device. In the Remarks section of the response Bard discussed claims 21–23, the claims specific to sequential energizing. We discern no support for M3's argument that Bard misrepresented the content of the PCT application, or that the examiner did not consider the PCT application adequately. The examiner initialed on December 15, 1989 that he had considered this reference, the same day a telephone interview was held that led to an examiner's amendment, followed by allowance on January 3, 1990. The charge of fraud based on these events is totally without substance.

Conclusion

These asserted flaws in patent prosecution, separately or taken together, do not constitute substantial evidence of fraud. The verdicts of fraud in procuring the '056 and '308 patents can not stand, and the judgment on these verdicts is reversed.

VI

ANTITRUST ISSUES

Antitrust violation was found on special verdicts that Bard by anticompetitive conduct had monopolized or attempted to monopolize the relevant markets for each of fully automated biopsy guns and needles, guns alone, and replacement needles. The jury instructions on the antitrust count identified three separate claims; first, that the patents were procured by fraud followed by attempts to enforce the fraudulently procured patents; second, that Bard threatened and then brought suit knowing that its patents were invalid, unenforceable, or not infringed; and third, that Bard unlawfully leveraged its monopoly power in the guns to obtain a competitive advantage in replacement needles by modifying its gun to accept only Bard needles. The jury found in favor of M3 Systems and against Bard on every question, and assessed compensatory damages, measured primarily as litigation costs, of $1.5 million, which were trebled as required by section 4 of the Clayton Act. Bard argues that the findings are not supported by substantial evidence, and that judgment as a matter of law should have been granted.

A. The Walker Process Claim

[40] Fraud in obtaining a United States patent is a classical ground of invalidity or unenforceability of the patent. In *Walker Process*, 382 U.S. 172, 86 S.Ct. 347, 147 USPQ 404 the Court established that antitrust liability under section 2 of the Sherman Act may arise when a patent has been procured by knowing and willful fraud, the patentee has market power in the relevant market, and has used its fraudulently obtained patent to restrain competition. Restraint on competition based on power in the relevant market must be established on the criteria of section 2, when the patent has been fraudulently obtained. *See Nobelpharma*, 141 F.3d at 1068, 46 USPQ2d at 1104;[7] *Spectrum Sports, Inc. v. McQuillan*, 506 U.S. 447, 455–56, 113 S.Ct. 884, 122 L.Ed.2d 247 (1993) (explaining *Walker Process* as requiring appraisal of the exclusionary power of the fraudulently obtained patent in terms of the relevant market for the product involved).

The jury found by special verdicts that the '056 and '308 patents were obtained by fraud in their prosecution before the PTO, as discussed in Part V, *ante*. The jury also

7. In *Nobelpharma* the Federal Circuit held in banc that Federal Circuit law would thenceforth apply to determination of whether fraudulent conduct occurred in obtaining a patent, whereas determination of the other elements of the section 2 violation, *viz.* market power in the relevant market and illegal restraints on competition, since not unique to the patent right would continue to be governed by regional circuit law. 141 F.3d at 1067–68, 46 USPQ2d at 1104.

found that "there is a relevant product market" for the biopsy guns and needles, together and separately, that Bard had monopoly power in each market and had "engaged in restrictive or exclusionary conduct with the conscious object of acquiring monopoly power in that market."

[41] It is not presumed that the patent-based right to exclude necessarily establishes market power in antitrust terms. *See Abbott Labs. v. Brennan*, 952 F.2d 1346, 1354, 21 USPQ2d 1192, 1199 (Fed.Cir.1991) (possession of patent, and market advantages thus gained, do not establish antitrust market power). The virtually unlimited variety and scope of patented inventions and market situations militate against per se rules in these complex areas. Unless the patent had been obtained by fraud such that the market position had been gained illegally, the patent right to exclude does not constitute monopoly power prohibited by the Sherman Act. *Walker Process*, 382 U.S. at 177–78, 86 S.Ct. 347, 147 USPQ at 407. As the Second Circuit stated in *SCM Corp. v. Xerox Corp.*, "No court has ever held that the antitrust laws require a patent holder to forfeit the exclusionary power inherent in his patent the instant his patent monopoly affords him monopoly power over a relevant product market." 645 F.2d 1195, 1204, 209 USPQ 889, 899 (2d Cir.1981).

[42] Thus it was necessary for M3 Systems to establish market power as well as fraudulent procurement of the patent and that Bard's related commercial activity was coupled with violations of section 2. In addition, applying the law of the Seventh Circuit to the elements of section 2, M3 was required to establish that Bard had a specific intent to monopolize, engaged in anti-competitive conduct, and had a dangerous probability of success. *See Great Escape, Inc. v. Union City Body Co.*, 791 F.2d 532, 540 (7th Cir. 1986). These issues were argued at trial, and by special verdicts the jury found culpability on the part of Bard. However, in view of the incorrect verdicts on the question of fraud in procurement of the '056 and '308 patents, as discussed in Part V, as a matter of law the judgment of antitrust violation can not be sustained on *Walker Process* grounds.

B. "Sham" Litigation

[43] Conduct prohibited under antitrust law includes bringing suit to enforce a patent with knowledge that the patent is invalid or not infringed, and the litigation is conducted for anti-competitive purposes. In such events the antitrust immunity of *Noerr–Pennington* and *California Motor Transp. Co. v. Trucking Unltd.*, 404 U.S. 508, 92 S.Ct. 609, 30 L.Ed.2d 642 (1972) does not apply to those who seek redress through judicial process.

The Supreme Court in *Professional Real Estate Investors, Inc. v. Columbia Pictures Indus., Inc.* (*PRE*) established the two-part criteria of "sham" litigation: (1) the lawsuit must be objectively meritless such that "no reasonable litigant could expect success on the merits" and (2) it must be found that "the baseless lawsuit conceals 'an attempt to interfere directly with the business relationships of a competitor.' " 508 U.S. 49, 60, 113 S.Ct. 1920, 123 L.Ed.2d 611, 26 USPQ2d 1641, 1646 (1993) (emphasis in original) (quoting *Eastern R.R. Presidents Conf. v. Noerr Motor Freight, Inc.*, 365 U.S. 127, 144, 81 S.Ct. 523, 5 L.Ed.2d 464 (1961)). The Court declined to decide "whether and, if so, to what extent *Noerr* permits the imposition of antitrust liability for a litigant's fraud or other misrepresentations." *PRE*, 508 U.S. at 62 & n. 6, 113 S.Ct. 1920, 26 USPQ2d at 1646–47 & n. 6. Fraud in the procurement of a patent is governed by *Walker Process* and, as in *PRE*, the complainant "must still prove a substantive antitrust violation." *PRE*, 508 U.S. at 61, 113 S.Ct. 1920, 26 USPQ2d at 1646.

[44] Thus although sham litigation as a tactic to destroy competition can lead to antitrust violation, *see U.S. Philips Corp. v. Sears Roebuck & Co.*, 55 F.3d 592, 597, 34 USPQ2d 1699, 1703 (Fed.Cir.1995); *cf. Handgards, Inc. v. Ethicon, Inc.*, 743 F.2d 1282, 1288, 223 USPQ 214, 222–23 (9th Cir. 1984) (addressing *Noerr–Pennington* issue

and explaining that to invoke "sham" exception the claimant must show "some abuse of process," and requiring clear and convincing evidence of bad faith), sham litigation requires more than a failed legal theory. *PRE*, 508 U.S. at 60–61 & n. 5, 113 S.Ct. 1920, 26 USPQ2d at 1646 & n. 5; *see Carroll Touch, Inc. v. Electro Mechanical Sys., Inc.*, 15 F.3d 1573, 1582, 27 USPQ2d 1836, 1844 (Fed.Cir. 1993).

[45, 46] Neither the bringing of an unsuccessful suit to enforce patent rights, nor the effort to enforce a patent that falls to invalidity, subjects the suitor to antitrust liability. *Cf. Concrete Unltd. Inc. v. Cementcraft, Inc.*, 776 F.2d 1537, 1539, 227 USPQ 784, 785 (Fed.Cir.1985) (no liability for unfair competition based on suit to enforce an invalid patent). Since a principal purpose of the patent system is to provide innovators with a property right upon which investment and other commercial commitments can be made, absent the *PRE* criteria the patentee must have the right of enforcement of a duly granted patent, unencumbered by punitive consequences should the patent's validity or infringement not survive litigation. *See id.* The law recognizes a presumption that the assertion of a duly granted patent is made in good faith, *see Virtue v. Creamery Package Mfg. Co.*, 227 U.S. 8, 37–38, 33 S.Ct. 202, 57 L.Ed. 393 (1913); this presumption is overcome only by affirmative evidence of bad faith. *See PRE, supra.*

[47] M3 Systems states that Bard knew its patents were not infringed when it brought suit, citing the testimony of a Bard engineer that he did not think the original M3 needle infringed the '056 patent and that other Bard employees had told him that M3 changed its needle design to one that did not infringe. The engineer also testified that he did not know whether those who told him M3's needles did not infringe had ever read the '056 patent, or whether they were familiar with the concept of infringement under the doctrine of equivalents. This was the totality of the evidence of sham litigation concerning the '056 patent; there was no evidence at all with respect to the '308 patent.[8] This does not constitute substantial evidence that this litigation was objectively meritless and brought in bad faith. The judgment of antitrust violation can not be upheld on sham litigation grounds.

C. Attempt to Monopolize [9]

M3 Systems proposed that Bard had modified its biopsy gun and needles for the purpose of preventing use of Tru–Cut needles and then to exclude M3's copies so that they did not fit the gun without an adapter. M3 contends that Bard's motives were anticompetitive, pointing to Bard documents showing internal discussions of competitive products and concern for patent scope and market share. Bard replies that the Tru–Cut was not suitable for its new gun because it could not achieve reverse motion, and points out that M3's witness acknowledged that M3 could effectively compete, as were several other producers of biopsy guns and needles.

Bard was under no duty to facilitate M3's competition by refraining from changing its products. The jury instructions did not distinguish patent-supported products and markets based thereon from actions described to the jury as being in restraint of trade. For example, the jury instruction on intent to monopolize was as follows:

> M3 Systems also alleges that it was injured by Bard's unlawful attempt to mo-

8. M3 in its brief states that: "The Jury specifically found that BARD had 'actual knowledge' that M3 did not infringe its patents or that the patents were invalid. [A10096; 11–3 ¶¶ 6,11]." There is no specific finding in the verdict form of "actual knowledge." The cites to ¶¶ 6 & 11 are to the jury's finding of patent misuse, and the jury instructions at A10096 concern the duty of candor to the PTO. The source of the quoted "actual knowledge" is not given. Such misdirections are not helpful to the appellate tribunal; see also note 6, *supra*.

9. The court has affirmed the district court's judgment of antitrust violation on this ground; see the separate opinion of Judge Bryson, joined by Chief Judge Mayer. This section contains the dissenting opinion of Judge Newman.

nopolize. An attempt to monopolize may be proven even if Bard lacks monopoly power, but because of its alleged exclusionary conduct, there exists a dangerous probability that Bard will obtain monopoly power in any market. In order to win on its claims of attempted monopolization, M3 Systems must prove each of the following elements by a preponderance of the evidence:

> First, that Bard had a specific intent to achieve monopoly power in a relevant market; second, that Bard engaged in exclusionary or restrictive conduct in furtherance of its specific intent; third, that there was a dangerous probability that Bard would obtain monopoly power in the relevant market; and, fourth, that M3 Systems was injured in its business or property by Bard's conduct.

In explaining further, the district court referred to "exclusionary or restrictive conduct" and "unreasonable acts and practices," again without reference to patented products and their status in the law. Although the court instructed that "conduct that involves the introduction of superior products" is not exclusionary or restrictive, the court also stated that "where conduct is ambiguous, direct evidence of a specific intent to monopolize may lead you to conclude that the conduct was intended to be and was in fact exclusionary or restrictive." No mention was made of the patentee's statutory right to exclude, and there was no instruction to consider that right.

These broadly stated descriptions of exclusionary or restrictive conduct, unlimited by the conditions set in *Walker Process* or *PRE* and taking no cognizance of the legal rights of the patent grant, do not rise to the level of violation of antitrust law. Thus I must, respectfully, dissent from the court's ruling that Bard incurred liability under the Sherman and Clayton Acts by its actions in modifying and improving its patented products, thereby requiring M3 to provide an adapter with its replacement needles for the Bard gun.

The panel majority on this issue holds that the jury verdict of monopoly power must be sustained, although the power held by Bard in this market is based on the patent right. Bard or its predecessor Radiplast changed from the Tru-Cut to a newly designed needle that was capable of reverse movement, thus facilitating removal, inspection, and reinsertion of the inner needle while the cannula remained in place. This needle assembly is the subject of the '056 patent. The record states that M3 was obliged to use an adapter to fit its existing needles to Bard's gun; that is the antitrust ill of which M3 complained. This does not, as a matter of law, present a jury question of violation of the Sherman Act. *See California Computer Prods., Inc. v. International Bus. Mach. Corp.*, 613 F.2d 727, 744 (9th Cir.1979) (when the innovation is an improvement, that it affects competition is not an antitrust violation, and no jury question arises).

Both the needle assembly alone and the integrated biopsy gun/needle device were patented. They were subject to Bard's patent-based rights to exclude others from making, using, or selling them. It was not Bard's changes to its biopsy gun or needles that affected M3's sale of replacement needles; it was the patents on these products. To hold that Bard could violate the Sherman Act by changing these products, if M3's business was adversely affected, is a novel and pernicious theory of antitrust law that is contrary to the principles of competition, and fraught with litigation-generating mischief.

Despite this court's recent affirmation in *Virginia Panel Corp. v. MAC Panel Co.*, 133 F.3d 860, 873–74, 45 USPQ2d 1225, 1236 (Fed.Cir.1997) that "a patentee may lawfully police a market that is effectively defined by its patent," this court now holds that changing and improving one's proprietary product that has created its own market niche, if to a competitor's potential disadvantage, is actionable under the Sherman Act. The competition-favoring rule is that an innovator has no duty to help its competitors: "It is the possibility of success in the marketplace, attributable to superior performance, that provides the incentives on which the proper functioning of our competitive economy rests." *Ber-*

key Photo, Inc. v. Eastman Kodak Co., 603 F.2d 263, 281 (2d Cir.1979). In *California Computer* the court observed that "[IBM] was under no duty to help CalComp or other peripheral equipment manufacturers survive or expand." 613 F.2d at 744. This court has today created a new, vague, and unworkable cause of action, of clear public detriment, with no balancing public benefit.

The concept that antitrust law should bar an innovator from making changes or improvements to its products, when others may be affected thereby, is not brand new. However, cases where this issue has been litigated have been of a different order of competitive impact than here asserted; and I have found no case in which such a charge has been sustained. In *In re IBM Peripheral EDP Devices Antitrust Litig.*, 481 F.Supp. 965, 1002–05 (N.D.Cal.1979), *aff'd sub nom. Transamerica Computer Co. v. International Bus. Mach. Corp.*, 698 F.2d 1377 (9th Cir. 1983), cited by the panel majority, the district court declined to assess liability for IBM's interface changes that prevented use of competitors' peripheral devices when "the contested changes were improvements in the products, were not unreasonably restrictive of competition, and hence did not violate the Sherman Act." *Id.* at 1382.

A basic premise of patent law, and antitrust law in general, is that the commercial advantage gained by new technology, and its statutory protection by patent, do not convert the possessor thereof into a prohibited monopolist. In *United States v. Grinnell Corp.*, 384 U.S. 563, 570–71, 86 S.Ct. 1698, 16 L.Ed.2d 778 (1966) the Court distinguished the willful acquisition or maintenance of monopoly power from "growth or development as a consequence of a superior product, business acumen, or historic accident." *See also Jefferson Parish Hospital District No. 2 v. Hyde*, 466 U.S. 2, 37 n. 7, 104 S.Ct. 1551, 80 L.Ed.2d 2 (1984) ("A common misconception has been that a patent or copyright, a high market share, or a unique product that competitors are not able to offer suffices to demonstrate market power.") (O'Connor, J., concurring); *A.I. Root Co. v. Computer/ Dynamics, Inc.*, 806 F.2d 673, 676 (6th Cir.1986) (rejecting "any absolute presumption of market power for copyright or patented product").

When the market for new technology is protected by patent, to violate the antitrust law there must be an improper use of the patent right, "coupled with violations of § 2." *Walker Process*, 382 U.S. at 177–78, 86 S.Ct. 347, 147 USPQ at 407. In *Walker Process* the Court again explained that a patent does not of itself establish a presumption of market power in the antitrust sense. *Id.* at 178, 86 S.Ct. 347, 147 USPQ at 406. In *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1367, 220 USPQ 763, 776 (Fed.Cir.1984), this court wrote that "patent rights are not legal monopolies in the antitrust sense of the word." Yet in the case now before us the jury was asked to determine simply whether Bard had monopoly power in a relevant market, without reference to whether the "exclusionary conduct" of which M3 complained was the conduct of the patent law.

M3 did not allege the elements of an antitrust violation when patents are involved. *See, e.g., Double D Spotting Service, Inc. v. Supervalu, Inc.*, 136 F.3d 554, 558 (8th Cir. 1998) (" 'The essential elements of a private antitrust claim must be alleged in more than vague and conclusory terms to prevent dismissal of the complaint on a defendant's [Rule] 12(b)(6) motion.' ") (quoting *Crane & Shovel Sales Corp. v. Bucyrus–Erie Co.*, 854 F.2d 802, 805 (6th Cir.1988)); *Okusami v. Psychiatric Institute of Washington, Inc.*, 959 F.2d 1062, 1065 (D.C.Cir.1992) ("[T]he plaintiff's antitrust claims, lacking the essential element of an agreement, were properly dismissed for failure to state a claim upon which relief could be granted.") Dismissal for failure to state a claim was the proper response to M3's undifferentiated assertion of anticompetitive practices.

I need not elaborate on the litigation opportunity affecting innovation-based industry, that is here so casually enabled. "Where competitors' products must interface with the monopolist's product the monopolist's intro-

duction of a new product that makes that interconnection more difficult or expensive might violate Section 2, although *no court has specifically so held.*" 1 American Bar Assoc., *Antitrust Law Developments* 286 (4th ed.1997) (emphasis added). As a sister circuit recently stated, "Antitrust scholars have long recognized the undesirability of having courts oversee product design, and any dampening of technological innovation would be at cross-purposes with antitrust law." *United States v. Microsoft Corp.*, 147 F.3d 935, 948 (D.C.Cir.1998).

The proceedings at trial, and the jury instructions, made no mention of the patent rights here present. It is without precedent to find antitrust liability premised on a theory that development of new products is illegally anticompetitive when the new product requires competing suppliers to adjust their product accordingly. Commentators who have considered the question of "whether product innovation can ever be unlawfully 'predatory' " have concluded that "no administrable rule could be fashioned that would not exact an unreasonably heavy toll." 3 Phillip E. Areeda & Herbert Hovenkamp, *Antitrust Law* § 705b (rev. ed.1996). If this court deems it appropriate to add this burden to patent-based innovation, there should at least be some overriding public benefit. However, antitrust jurisprudence has well understood that the enforcement of the antitrust laws is self-defeating if it chills or stifles innovation. *See IBM Peripheral, supra.*

Neither the jury instructions nor the special interrogatories framed a charge of predatory conduct that comports with established criteria of antitrust liability. It appears that this charge at trial was cobbled together from left-over allegations of bad acts by bad actors. Indeed, M3's antitrust counterclaims mention only *Walker Process* fraud and sham litigation, which all members of this panel agree were not established. I can not discern, in the law or in the record of this case, either legal or factual support for this new form of antitrust liability.

VII

MISUSE; OTHER ISSUES

[48] The defense of patent misuse arises from the equitable doctrine of unclean hands, and relates generally to the use of patent rights to obtain or to coerce an unfair commercial advantage. Patent misuse relates primarily to a patentee's actions that affect competition in unpatented goods or that otherwise extend the economic effect beyond the scope of the patent grant. *See Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 703–04, 24 USPQ2d 1173, 1176 (Fed.Cir.1992) ("The concept of patent misuse arose to restrain practices that did not in themselves violate any law, but that draw anticompetitive strength from the patent right, and thus were deemed to be contrary to public policy.")

[49, 50] Patent misuse is viewed as a broader wrong than antitrust violation because of the economic power that may be derived from the patentee's right to exclude. Thus misuse may arise when the conditions of antitrust violation are not met. *See Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 140–41, 89 S.Ct. 1562, 23 L.Ed.2d 129, 161 USPQ 577, 597 (1969). The key inquiry is whether, by imposing conditions that derive their force from the patent, the patentee has impermissibly broadened the scope of the patent grant with anticompetitive effect. *See Virginia Panel Corp. v. MAC Panel Co.*, 133 F.3d 860, 868, 45 USPQ2d 1225, 1231–32 (Fed.Cir.1997); *B. Braun Medical, Inc. v. Abbott Labs.*, 124 F.3d 1419, 1426, 43 USPQ2d 1896, 1902 (Fed. Cir.1997); *Mallinckrodt*, 976 F.2d at 704, 24 USPQ2d at 1176.

[51, 52] The jury returned special verdicts that Bard had misused both the '056 and '308 patents. Patent misuse arises in equity, and a holding of misuse renders the patent unenforceable until the misuse is purged; it does not, of itself, invalidate the patent. *See Morton Salt Co. v. G.S. Suppiger Co.*, 314 U.S. 488, 62 S.Ct. 402, 86 L.Ed. 363 (1942); *Senza-Gel Corp. v. Seiffhart*, 803 F.2d 661, 668 n. 10, 231 USPQ 363, 368 n. 10 (Fed.Cir.1986). When a jury has determined that patent misuse occurred we review the underlying findings of fact for support by substantial evidence, presuming that the jury

resolved any factual disputes in favor of the verdict winner. We then determine whether, on the found or presumed facts, the conclusion on the issue of misuse is correct. *See Virginia Panel*, 133 F.3d at 868, 45 USPQ2d at 1231–32.

[53] The jury instruction on patent misuse was focussed primarily on the charge that Bard was attempting to enforce the patents against goods known not to be infringing, the court explaining that antitrust violation is not necessary to find misuse if patents have been used "wrongfully" to exclude competitors:

> A patent is unenforceable for misuse if the patent owner attempts to exclude products from the marketplace which do not infringe the claims of the patent and the patent owner has actual knowledge that those products do not infringe any claim of the patents. The patent is also unenforceable for misuse when a patent owner attempts to use the patent to exclude competitors from their marketplace knowing that the patent was invalid or unenforceable.
>
> A patent will not be rendered unenforceable for misuse if the patent owner has enforced the patent in the good faith belief that the accused products infringed the patent's claims.
>
> You may consider all aspects of the conduct of the patent owner in deciding whether a patent has been misused. In order to find misuse, you may not determine that—you need not determine that an antitrust violation has been proved. Even if an antitrust violation has not been proven, you may still find that the patents have been misused if you conclude that the patents have been used wrongfully.

This instruction calls to mind the view expressed in *USM Corp. v. SPS Techs., Inc.*, 694 F.2d 505, 510, 216 USPQ 959, 963 (7th Cir.1982) that the misuse doctrine is "too vague a formulation to be useful." Although the defense of patent misuse indeed evolved to protect against "wrongful" use of patents, the catalog of practices labelled "patent misuse" does not include a general notion of "wrongful" use. *See id.* ("in application, the doctrine has largely been confined to a handful of specific practices").

[54] M3 Systems did not propose any of the classic grounds of patent misuse, such as tying or enforced package licensing or price restraints or extended royalty terms, *see* Chisum, *supra*, § 19.04[3], but generally urged the view that Bard's actions, even if not illegal, were an improper use of patents. Although the law should not condone wrongful commercial activity, the body of misuse law and precedent need not be enlarged into an open-ended pitfall for patent-supported commerce.

There was no evidence that Bard's competitive activities were either per se patent misuse or that they were not "reasonably within the patent grant." *See Mallinckrodt*, 976 F.2d at 708, 24 USPQ2d at 1180. The conduct to which the jury instruction on misuse generally refers, that is, "wrongful" enforcement of patents, is activity protected under *Noerr* and *California Motor*, and is not subject to collateral attack as a new ground of "misuse." M3 Systems adduced no evidence of patent misuse other than was presented for its antitrust claims. It is not patent misuse to bring suit to enforce patent rights not fraudulently obtained, nor is otherwise legal competition such behavior as to warrant creation of a new class of prohibited commercial conduct when patents are involved.

The verdicts of patent misuse are not supported by evidence or correct legal theory. The judgment on these verdicts is reversed.

Other Arguments/Issues

We have not discussed every minor argument and issue raised in this appeal. All have been considered, and we have discussed those of relevance. With respect to Bard's frequent references to jury prejudice resulting from disclosure to the jury of Bard's recent civil penalties and criminal convictions for several violations of Food and Drug Administration laws and regulations, we take

note that no motion for a new trial was made on this ground, and the issue is not before us for review.

Costs

No costs.

AFFIRMED IN PART, REVERSED IN PART, VACATED IN PART, AND REMANDED

MAYER, *Chief Judge*, concurring-in-part and dissenting-in-part.

I join the court's opinion as it pertains to the validity and infringement of the '308 patent, and agree that the jury's verdict on fraud cannot stand. I join Judge Bryson's opinion sustaining the jury verdict on M3's antitrust counterclaim and remanding. My views on the validity of the '056 patent follow.

By special interrogatory, a jury found each of the disputed claims of the '056 patent invalid because the claimed invention was on sale in the United States more than one year before July 30, 1986, the filing date of the '056 patent's parent application. M3 Systems presented the jury with two reasons why the invention may be invalid for violation of the on sale bar: a transfer from Radiplast to Pharmaseal of 250 needles in June 1985 and an offer from Radiplast to Dr. Ronald Phelps in November 1984. We may affirm the invalidity verdict on either basis. *See, e.g., Ethicon Endo–Surgery, Inc. v. United States Surgical Corp.*, 93 F.3d 1572, 1582, 40 USPQ2d 1019, 1027 (Fed.Cir.1996). Because I believe that the jury had substantial evidence that Radiplast placed the invention claimed in the '056 patent on sale in November 1984, I would sustain the jury's verdict of invalidity.

Discussion

[55] An inventor who places his invention "in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States" loses his right to patent the invention. 35 U.S.C. § 102(b) (1994). A determination that a product was placed on sale under section 102(b) is a question of law, based on underlying facts. *See, e.g., KeyStone Retaining Wall Sys. Inc. v. Westrock, Inc.*, 997 F.2d 1444, 1451, 27 USPQ2d 1297, 1303 (Fed.Cir. 1993). While we review the trial court's ultimate determination of a section 102(b) bar *de novo, see, e.g., Ferag AG v. Quipp, Inc.*, 45 F.3d 1562, 1566, 33 USPQ2d 1512, 1515 (Fed.Cir.1995); *U.S. Environmental Products Inc. v. Westall*, 911 F.2d 713, 715, 15 USPQ2d 1898, 1900 (Fed.Cir.1990), in considering its denial of Bard's motion for judgment as a matter of law, we review the jury's verdict, as did the trial court, for substantial evidence. *See, e.g., Shatterproof Glass Corp. v. Libbey–Owens Ford Co.*, 758 F.2d 613, 619, 225 USPQ 634, 636 (Fed.Cir.1985); *Railroad Dynamics, Inc. v. A. Stucki Co.*, 727 F.2d 1506, 1513, 220 USPQ 929, 936 (Fed.Cir. 1984). " 'Substantial' evidence is such relevant evidence from the record taken as a whole as might be accepted by a reasonable mind as adequate to support the finding under review." *Perkin–Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 893, 221 USPQ 669, 673 (Fed.Cir.1984).

We are guided in our review of the legal conclusion by principles underlying the on sale bar: broad and prompt disclosure of inventions to the public; providing opportunity to experiment, improve, and determine the market value of inventions; discouraging inventors from withdrawing inventions that the public has already come to believe are freely available; and discouraging commercialization that expands the patent system's grant of the right to exclude others. *See, e.g. Envirotech Corp. v. Westech Eng'g, Inc.*, 904 F.2d 1571, 1574, 15 USPQ2d 1230, 1232 (Fed. Cir.1990); *King Instrument Corp. v. Otari Corp.*, 767 F.2d 853, 860, 226 USPQ 402, 407 (Fed.Cir.1985); *General Electric Co. v. United States*, 228 Ct.Cl. 192, 654 F.2d 55, 61, 211 USPQ 867, 873 (Ct.Cl.1981). Because the ultimate determination of whether an on sale bar exists rests on the totality of the circumstances, that is, on consideration of the unique facts of each transaction or event, no one factor necessarily controls. *See, e.g.,*

Ferag, 45 F.3d at 1566, 33 USPQ2d at 1515. Nevertheless, we have held that "[f]oremost among these is the policy of preventing inventors from exploiting the commercial value of their inventions while deferring the beginning of the statutory term. To this end, the inventor is strictly held to the requirement that he file his patent application within one year of any attempt to commercialize the invention." *Ferag*, 45 F.3d at 1566, 33 USPQ2d at 1515 (internal citation omitted). The inventor is entitled to the full benefit of the patent regime; the public is entitled to full, timely disclosure of the protected invention.

We are likewise guided in our review by the principle that we must presume facts necessary to support the jury verdict. *See, e.g., Perkin-Elmer*, 732 F.2d at 893, 221 USPQ at 673; *Railroad Dynamics*, 727 F.2d at 1516, 220 USPQ at 939. Given the on sale bar verdict, we assume the jury found that Radiplast made a definite offer to sell certain subject matter and that this subject matter "fully anticipated the claimed invention or would have rendered the claimed invention obvious by its addition to the prior art." *UMC Elec. Co. v. United States*, 816 F.2d 647, 656, 2 USPQ2d 1465, 1472 (Fed.Cir. 1987); *see also LaBounty Mfg., Inc. v. United States Int'l Trade Comm'n*, 958 F.2d 1066, 1071, 22 USPQ2d 1025, 1028 (Fed.Cir.1992). Thus, on review we must affirm the verdict of invalidity of the '056 patent if these factual findings are supported by substantial evidence, and within the context of the various policies underlying the on sale bar, the totality of circumstances supports the ultimate legal conclusion.

I. Offer for Sale

On September 25, 1984, Ronald Phelps, an Alabama medical doctor, sent Radiplast AB a letter that stated: "I am interested in learning more about the new device for percutaneous needle biopsy pictured on the enclosed brochure. I would appreciate it if you would send me all the information you have pertaining to the instrument. Also, please include a price list. Thank you." Phelps included with this letter a brochure entitled "Radibiospy device, a new device for percutaneous needle biopsy." This brochure described previously existing technology and then stated:

> A new device has been constructed in order to improve this biopsy method. With the aid of this instrument the biopsy procedure can be carried out with one hand, and as the movements of the obturator and cannula are automatized, better tissue specimens are obtained. All biopsies can be performed by one examiner under dynamic ultrasonic control, or under fl[uo]roscopy.
>
> The new device consists of a spring-trigger system for firing the two different parts of the needle—the cannula and the obturator.
>
> It is constructed of alloyed brass and, like the pressure rod, can be autoclaved.
>
> See special instructions before using.
>
> Manufactured by ... RADIPLAST AB....

By way of its managing director, Thomas Engström, Radiplast, replied as follows to Phelps' letter on November 12, 1984:

> We thank you for your letter of [S]ept. 25[,] 1984 and for your interest in our BIOPSY DEVICE. I am truly sorry for my late reply.
>
> Our generation No. 2 of the device will we, together with our new biopsy needles suitable for the device, start marketing in USA beginning of—85, at the moment we do not know through which company.
>
> *If you do not want to wait* until we have our representation in USA arranged, *you can always [sic] order the device* directly from us.
>
> Our price for the device *is* SEK 9.900,- and for the needles SEK 75,/ea.
>
> The device *is* reusable and can be autoclaved. Very little service has to be done on the device due to reliable design. The needles *are* dispo[s]able and are designed to suit the device.
>
> I am enclosing leaflet and article.

I am looking forward to hearing from you.

(Emphasis added).

The Radiplast brochure that Phelps sent to Radiplast describes a device that can be operated with one hand, by one operator, leaving the physician's other hand free to operate the ultrasound or fluoroscopy equipment. The brochure describes both parts of the needle as automatized by way of a spring-trigger system. It describes the construction materials used to manufacture the device as well as a procedure by which it can be cleaned. In short, the brochure can be understood to describe either a first generation prior art device or the second generation device described in the '056 patent.

Despite this ambiguity, Engström's reply to Phelps' letter in November 1984 is far more telling both in what it said and when it said it. His letter explicitly refers to the second generation device and "new biopsy needles suitable for the device." Since the second generation device requires a needle that moves both forward and rearward, unlike the prior art TruCut needle, Engström's letter is a clear offer for sale of the second generation device and new biopsy needles. With the exception of a reference to marketing efforts being made in the United States and the possibility of sales through a United States distributor thereafter, this letter was written entirely in the present tense.

The letter was also written after a series of correspondence between Radiplast and Hart Enterprises, a United States medical device manufacturer, addressing tooling and manufacturing costs for these new biopsy needles. On September 4, 1984, Engström had written: "Enclosed please find ... a drawing on the biopsy needle. The stainless steel parts are not the final ones, there could be changes in length, diam. and the design of the point." On September 28, 1984, Hart Enterprises responded: "[E]nclosed are two drawings, one of the Stylet Hub and one of the Cannula Hub for your Radiplast Biopsy Needle. If you approve these concepts we will proceed to make a prototype, and then production of the molds." Radiplast replied on October 18, 1984: "Biopsy needles: Enclosed please find our order for tooling and engineering. We approve your design of the plastic parts. The dimension from the top surface to center line of both cannula and stylet should be 4.2 mm. Regarding the needles we will probably start with 2.000—3.000 units bulk packed." Less than one month later, Engström sent Phelps the November 12, 1984, letter.

These facts alone are sufficient support for the jury's verdict that there was a definite offer for sale of something more than the TruCut prior art or first generation needles. However, to apply the on sale bar, the jury also had to decide whether this offer for sale of new biopsy needles was an offer of the invention claimed in the '056 patent. We review this second presumed factual finding for substantial evidence, and like the district court on its denial of Bard's motion for judgment as a matter of law, we also consider whether there may be policy considerations against imposing the on sale bar.

II. Offer of the Claimed Invention

Bard claims that Radiplast's November 1984 offer to sell second generation devices and new biopsy needles cannot trigger the bar because at that time no operable device had been made, FDA approval had not been obtained, Radiplast had not conducted clinical testing, it had not found a United States distributor, and it had not developed a final needle design. Bard misapprehends the legal significance of each of these. Clinical testing is not required before a sale can bar patent rights. Nor can subsequent clinical testing excuse a prior sale, if what was offered for sale was the claimed invention. Clinical testing is merely one possible policy reason why a particular sale might be excused from the bar. Since Radiplast did not contemplate sales to Engström for testing purposes, the possibility of subsequent clinical testing is of no moment. Likewise, FDA approval is not required before a sale can bar patent rights. Even an illegal sale of the claimed invention before the critical date can bar patent rights. Nor is a domestic distrib-

utor relevant to the on sale bar inquiry; a sale by a foreign distributor, from a foreign country to the United States can bar patent rights. *See, e.g., In re Caveney,* 761 F.2d 671, 676–77, 226 USPQ 1, 4 (Fed.Cir.1985).

The first of Bard's two remaining arguments—that no operable device had been made—is a feint because manufacture of an operable device is not a prerequisite for application of the on sale bar. *See, e.g., Barmag Barmer Maschinenfabrik AG v. Murata Machinery, Ltd.,* 731 F.2d 831, 837, 221 USPQ 561, 565 (Fed.Cir.1984). While operability may or may not be relevant, *see, e.g., UMC,* 816 F.2d at 656, 2 USPQ2d at 1472 (reduction to practice is not a requirement for application of the on sale bar), manufacture of an operable device alone is not, *see, e.g., Continental Plastic Containers v. Owens Brockway Plastic Products, Inc.,* 141 F.3d 1073, 1078–79, 46 U.S.P.Q.2d 1277, 1281 (Fed. Cir.1998) (declining to extend exception from public use bar under section 102(b) in design patent case). Operability is relevant only to the extent it demonstrates that a claimed element of the invention had not yet been invented, or the inventors did not know they had a workable invention and thus had nothing to offer for sale. *See, e.g., Petrolite Corp. v. Baker Hughes, Inc.,* 96 F.3d 1423, 1427, 40 USPQ2d 1201, 1204 (Fed.Cir.1996) ("[T]he thrust of the on-sale inquiry is whether the inventor thought he had a product which could be and was offered to customers, not whether he could prevail under the technicalities of reduction to practice ....") (quoting *Paragon Podiatry Lab., Inc. v. KLM Lab., Inc.,* 984 F.2d 1182, 1187 n. 5, 25 USPQ2d 1561, 1570 n. 5 (Fed.Cir.1993)). Bard has not asserted the second circumstance, and as explained below, the alterations made after the offer for sale to Phelps did not address inventive aspects of the '056 patent's new biopsy needle.

As support for its remaining contention—that it had not developed the final design of the biopsy needle—Bard points to Engström's testimony, as managing director of Radiplast, and correspondence between Radiplast, American Pharmaseal, (one of Radiplast's potential distributors in the United States), and Alan Taylor (president of Hart Enterprises). Each of these letters was sent after the November 1984 offer for sale to Phelps, and each evidences continued testing of and proposed modifications to the second generation device and the new biopsy needles.*

Engström testified that American Pharmaseal's research and development laboratories conducted in-house testing. A technical report produced after this testing says that "testing [was] to insure functionality of the spring loaded activatior, the Biopty™ device, and the needle before releasing them to the field trial." As a result of its testing, American Pharmaseal recommended: "increas[ing] the strength of the stylet handle design and add[ing] the buffing operation to cannula grinding process." Engström testified that this advice was "to, how do you say, make some changes on the plastic parts and also the— what do you call that— well, the, for some plastic parts broke actually, so we put some, a stopper in the second generation device to prevent, if that happened, to prevent the stylet to go further on." Engström testified that on American Pharmaseal's advice, Radiplast added a "stop" to the second generation device, after the offer to Phelps.

Engström also testified that Radiplast conducted field trials in December 1985, from which it learned that "there was a potential risk for this one snapping back and hurt the doctor's hand," and "many patients thought the noise of the instrument was very disturbing." As a result, Radiplast added "an automatic retraction, a spring, actually, which took this handle back," and "some damping things, you know, to reduce the noise of the instrument." After these field trials, Engström sent a letter to Hart Enterprises on

* Reliance on Engström's trial testimony is inherently less reliable than contemporaneous documentary evidence. *Cf. TP Lab., Inc. v. Professional Positioners, Inc.,* 724 F.2d 965, 972, 220 USPQ 577, 583 (Fed.Cir.1984) (inventor's expressions of "subjective intent ... particularly after institution of litigation, is generally of minimal value").

January 15, 1985, which stated: "The needle should be changed according to our phone discussion, which means that the wings of the cannula hub should have the same length. Both should be as long as the shortest wing." A letter from Hart Enterprises to Engström on January 25, 1985, enclosed three drawings that show "[t]he cannula and stylet hub dimensions are identical to the drawings and prototype you had previously received, with the exception that the cannula hub wings are now [sym]metrical."

This evidence suggests that Radiplast modified the second generation device by altering the strength of the stylet handle design, adding a buffing operation to the cannula grinding process, a stopper, automatic retraction via a spring, damping to reduce noise, and equal length symmetrical cannula hub wings as long as the shortest wing. However, Bard cannot avoid the on sale bar merely by showing improvements to the invention after its commercialization. *See, e.g., Seal-Flex, Inc. v. Athletic Track and Court Constr.*, 98 F.3d 1318, 1324, 40 USPQ2d 1450, 1454–55 (Fed.Cir.1996). These changes must be something more than obvious mechanical adjustments; they have to be inventive redesigns that are claimed by the '056 patent. While some of Radiplast's changes resulted in different possible embodiments of, or additions to, the new biopsy needle that is claimed by the '056 patent, none of the changes are claimed in the text of the '056 patent. Moreover, contrary to Bard's contentions, its evidence suggests at the very least that Radiplast had "reason to expect" in November 1984, that its needle "would work for its intended purpose upon completion," *Micro Chemical, Inc. v. Great Plains Chemical Co., Inc.*, 103 F.3d 1538, 1545, 41 USPQ2d 1238, 1244, and that Radiplast had more than a mere conception from which it was working towards development, *see UMC*, 816 F.2d at 657, 2 USPQ2d at 1472.

Because Bard's evidence shows nothing beyond unclaimed mechanical adjustments to the needle design claimed in the '056 patent after the November 1984 offer for sale of new biopsy needles, the jury had substantial evidence in support of its finding that the November 1984 offer for sale generated a statutory bar. *See, e.g., Robotic Vision Sys., Inc. v. View Eng'g, Inc.*, 112 F.3d 1163, 1167, 42 USPQ2d 1619, 1623 (Fed.Cir.1997). A contrary view would attribute to the '056 patent additional limitations taken from later developed commercial embodiments. Because the claimed invention had been completed, Engström's new biopsy needle design calls for an outcome different from *Robotic Vision*, 112 F.3d 1163, 42 USPQ2d 1619 (remanded for further fact finding on the completion date of a computer software program), *Micro Chemical*, 103 F.3d at 1544, 41 USPQ2d at 1243 (only a proposed configuration existed and the invention remained to be completed), and *Shatterproof Glass*, 758 F.2d at 623, 225 USPQ at 640 (a reasonable jury could have found that "apparatus and method of the claims were not functional").

III. Policy Considerations

Other than the need for sufficient time to test the new biopsy needle design, which is not a policy consideration summoned by the November 1984 offer, Bard has not argued that there are policy considerations weighing against imposition of the on sale bar. Since the policies that underlie the bar focus on the inventors attempts to exploit the invention, not whether a potential purchaser was made aware of or understood it, discussion of Phelps' actual knowledge of the details of the invention or the differences between generations of the biopsy gun is irrelevant. *See, e.g., Ferag*, 45 F.3d at 1568, 33 USPQ2d at 1516 ("We emphasize that this is an objective test, and that at its heart lies the inventor's attempt to commercialize the invention.... [T]he measure of the bar is what was offered, not the patentee's intent.") In light of the strong policy of preventing exploitation of the commercial value of an invention while deferring commencement of the statutory term, I would affirm the jury's application of the on sale bar.

BRYSON, *Circuit Judge*, concurring in part and dissenting in part.

I concur in the portion of the court's opinion upholding the jury's verdict of non-in-

fringement of the '308 patent. I also concur in the portions of the court's opinion reversing the district court's judgment that the '308 patent is invalid, and overturning the jury's verdict on the issue of fraud. Accordingly, I join parts II–V, VI.A–B, and VII of Judge Newman's opinion.

With respect to portions of the judgment relating to the '056 patent, I agree with Chief Judge Mayer that the '056 patent is invalid under the "on-sale bar" of 35 U.S.C. § 102(b), although I take a somewhat different analytical path to that conclusion, as discussed below. Because I conclude that the '056 patent is invalid based on the on-sale bar, I do not reach the other grounds on which the jury found the '056 patent invalid.

Finally, Chief Judge Mayer and I agree that the jury verdict on M3's antitrust counterclaim must be affirmed. Because we do not uphold all of the grounds on which the jury found liability, however, we conclude that the jury may have improperly assessed damages on liability grounds that cannot stand. We therefore must remand for further proceedings to determine the proper amount of damages to be assessed on the antitrust counterclaim.

I

With respect to the on-sale bar, I believe that the June 1985 sale of 250 needles from Radiplast to Pharmaseal was sufficient to support the jury's verdict that the asserted claims of the '056 patent were rendered invalid by a sale more than one year before July 30, 1986, the effective filing date of the patent. It is undisputed that the needles sold in June 1985 embodied the invention of the '056 patent. Whether that sale was sufficient to invoke the on-sale bar turns on whether the sale falls within the "experimental purpose" exception to the on-sale bar.

A

In the summer of 1984, Radiplast began looking for a company "to distribute and promote the sales of [its] biopsy instruments in the United States." Pharmaseal, a potential distributor of the instruments, sent a telex to Radiplast stating that "before any formal purchasing plans can be made," it would have to conduct field trials "to determine the performance and specimen quality of your biopsy device and disposable needle." Pharmaseal sent letters to several hospitals in December 1984 inviting them to participate in a "field trial as a potential sales/distribution system for Radiplast devices."

Radiplast responded by telex on January 21, 1985, setting a price for the needles to be used in Pharmaseal's field trial and offering large-quantity discounts for batches of up to 50,000 needles. Radiplast's telex stated that "in order to be able to deliver both needles and instruments in beginning of March [1985], we need a [telex] order, preferably this week." It also stated that "we have to meet and discuss more in detail all things related with the marketing of our biopsy instrument in U.S." With respect to Pharmaseal's proposed field trial, Radiplast merely suggested that "if you would like [Dr. Lindgren, the inventor] to visit the hospitals performing the trial, in order to help them get started, he will be happy to help you."

Pharmaseal agreed to purchase the instruments and, on March 28, 1985, placed an order for 10 biopsy guns and 250 needles from Radiplast. The instruments were shipped in June 1985. It is undisputed that the June 1985 transaction constituted a sale and that the needles sold at that time embodied the invention of the '056 patent.

Pharmaseal conducted in-house testing of the devices in July 1985 before releasing the products to hospitals for the field trials. Following the in-house testing, Pharmaseal reported only minor problems and made minor manufacturing suggestions, such as recommending that Radiplast strengthen the stylet hub design and add a buffing operation to the cannula grinding process.

Although Bard contends that Dr. Lindgren attended some of the field trials and that Radiplast "was continually advised by Pharmaseal of [their] progress," Dr. Lindgren

testified that he did not exercise any control over the tests, that he did not recall ever seeing the instrument used during a test, and that he did not receive or maintain any data from the tests. Bard appears to concede that the test results were not maintained in confidence, and it points to no evidence showing that the primary purpose of the tests was to ensure that the claimed features of the invention would operate as intended.

The field testing was performed at the behest of Pharmaseal, the purchaser, not Radiplast or the inventor. Pharmaseal "assumed primary responsibility" for the tests, while Radiplast merely "had an ongoing interest" in the progress of the trials and "was kept informed" of the progress of the field trials. During the field trials, Pharmaseal and Radiplast continued to discuss market potential, potential prices and volumes, and an instructional videotape to teach proper use of the instruments.

B

Bard argues that the jury verdict cannot stand because the in-house testing at Pharmaseal and the hospital field trials show that the sale was for experimental testing purposes. The so-called "experimental testing" exception to the on-sale bar applies only if commercial exploitation is "merely incidental to the primary purpose of experimentation to perfect the invention." *Barmag Barmer Maschinenfabrik AG v. Murata Mach., Ltd.*, 731 F.2d 831, 839, 221 USPQ 561, 567 (Fed. Cir.1984). In determining whether the inventor made the sale in question for purposes of determining whether the invention would work for its intended purpose, a court must consider various factors, such as the amount of control the inventor exercised over the testing; the length of the test period; whether any payment was made; whether there was a secrecy obligation; whether progress records were kept; whether someone other than the inventor conducted the experiments; and the degree of commercial exploitation during the tests in relation to the purpose of the experimentation. *Baker Oil Tools, Inc. v. Geo Vann, Inc.*, 828 F.2d 1558, 1564, 4 USPQ2d 1210, 1214 (Fed.Cir.1987). Certain factors, such as the requirement that the inventor control the testing, that detailed progress records be kept, and that the purported testers know that testing is occurring, are critical to proving experimental purpose. *Lough v. Brunswick Corp.*, 86 F.3d 1113, 1120, 39 USPQ2d 1100, 1105 (Fed.Cir.1996) ("if the inventor has no control over the alleged experiments, he is not experimenting"); *see generally* 2 Donald S. Chisum, *Patents* § 6.02[7][c] (1998).

The evidence shows that Radiplast's primary purpose in making the sale to Pharmaseal was to market the patented invention through Pharmaseal, not to conduct tests to determine whether the claimed invention would work for its intended purpose. Neither the in-house testing at Pharmaseal nor the field trials at hospitals were conducted under the control or supervision of the inventor or Radiplast; instead, the tests were proposed, controlled, and monitored by Pharmaseal, the purchaser. Dr. Lindgren, the inventor, admitted at trial that he had no control over the field trials, that he did not maintain any test data, and that he did not recall receiving any test results. Radiplast was not aware of the identity of the patients in the field tests, the organs that were being biopsied, or the types of tests being performed; indeed, the patients were apparently not even informed that the biopsies were being conducted as part of a test. The hospitals participating in the field trials were told that the trials were intended as "a potential sales/distribution system for Radiplast devices." There is no evidence that any secrecy agreements were made with Pharmaseal, the hospitals, or any of the test participants. Finally, it is undisputed that Pharmaseal paid for the instruments and needles used in the tests. All of these factors point away from the conclusion that the sale was made for purposes of experimentation. *See Western Marine Elecs., Inc. v. Furuno Elec. Co.*, 764 F.2d 840, 846, 226 USPQ 334, 339 (Fed. Cir.1985) (no experimental use where evidence pointed to market testing rather than experimentation).

Significantly, at the time of the sale of 250 needles in June 1985, Radiplast had an open offer to sell large quantities of needles to Pharmaseal at bulk discount prices. The January 21, 1985, telex had offered batches of up to 50,000 needles for a specific price, and smaller quantities of 10,000 and 20,000 needles for somewhat higher prices. The offer of such large quantities of needles was clearly for commercial, rather than experimental, purposes, and by June 1985 it was clear that the needles that were being offered to Pharmaseal embodied the later-claimed invention. The bulk purchase offer provides further evidence that the June 1985 sale was not for experimental purposes. *See Seal-Flex, Inc. v. Athletic Track & Court Constr.*, 98 F.3d 1318, 1325, 40 USPQ2d 1450, 1455 (Fed.Cir.1996) (Bryson, J., concurring) ("if the sale or offer in question embodies the invention for which a patent is later sought, a sale or offer to sell that is primarily for commercial purposes and that occurs more than one year before the application renders the invention unpatentable"). Thus, it appears that Radiplast was marketing the later-claimed needles commercially at least by late June 1985. Its willingness to sell smaller quantities of needles to Pharmaseal to use in its field tests was evidently an accommodation to Pharmaseal, which conducted its own tests before distributing the needles to hospitals and doctors. The fact that Radiplast recognized that Pharmaseal intended to test the needles before distributing them in bulk, however, did not make Radiplast's offer and sale in 1985 any less commercial in nature.

The facts of this case are analogous to those in *U.S. Environmental Products, Inc. v. Westall*, 911 F.2d 713, 15 USPQ2d 1898 (Fed.Cir.1990). In *Westall*, this court affirmed a district court's conclusion that a patent was invalidated by a sale more than one year before the filing date. That conclusion was based primarily on (1) the lack of written progress records and the failure to adhere to a testing schedule; (2) the inventor's failure to maintain control over the testing; and (3) promotion of the invention during the testing. *Id.* at 717–18. In this case, as in *Westall*, the evidence shows that neither the in-house tests at Pharmaseal nor the field tests at hospitals were under the control of the inventor or his company. There is little or no evidence of any written progress records; indeed, the inventor was apparently never provided with any test results. Finally, the communications between Radiplast and Pharmaseal throughout the purported testing period emphasized commercial sales and projections, not controlled experimentation.

Bard relies heavily on *Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 20 USPQ2d 1746 (Fed.Cir.1991), for the proposition that providing price estimates for future sales does not otherwise vitiate the experimental testing exception. In *Continental*, however, this court noted that "no sales were ever made"; there was a joint development project between two companies to develop the invention; and the project was "cloaked in confidentiality." 948 F.2d at 1269–70, 20 USPQ2d at 1750. Because the circumstances in *Continental* are so different from the circumstances in this case, *Continental* is of no help to Bard.

C

Bard also contends that the Pharmaseal sale cannot constitute a bar under 35 U.S.C. § 102(b) because Radiplast did not make a profit on the transaction. The jury heard testimony, however, suggesting that Radiplast made a 60% profit on the Pharmaseal sale. Even ignoring any actual profit on the devices used in the field trials, it is clear that the Pharmaseal transaction was made primarily to develop a market for future sales, not primarily to test the claimed invention. At any rate, the failure to turn a profit is not determinative. "A patent owner may have created an on-sale bar despite *losing* money on a sale." *U.S. Envtl. Prods., Inc. v. Westall*, 911 F.2d 713, 717, 15 USPQ2d 1898, 1902 (Fed.Cir.1990).

II

In support of its antitrust counterclaim, M3 presented three theories to the jury: (1)

that Bard committed fraud in the procuring its patents (the *Walker Process* theory); (2) that Bard acted in bad faith in enforcing its patents (the "sham litigation" theory), and (3) that Bard modified its Biopty gun for the purpose of preventing its competitors' needles from being used in that gun. Bard challenges the sufficiency of the evidence to support the jury's verdict on each of those three theories. The panel is unanimous in concluding that the evidence is insufficient to support liability on the *Walker Process* and "sham litigation" theories. Chief Judge Mayer and I agree, however, that there is sufficient evidence to affirm the jury's antitrust liability verdict based on Bard's gun modification program, for the reasons set forth below.

A

[56] The jury considered evidence that Bard modified its Biopty gun to prevent its competitors' non-infringing, flangeless needles from being used in Bard's guns. By special verdicts, the jury found that there was a relevant product market for replacement needles for fully automated reusable biopsy guns, that Bard had monopoly power in that market, and that it had acquired or maintained its monopoly power in that market through restrictive or exclusionary conduct.

In order to prevail on its claim of an antitrust violation based on Bard's modification of its Biopty gun to prevent the use of competing replacement needles, M3 was required to prove that Bard made a change in its Biopty gun for predatory reasons, *i.e.*, for the purpose of injuring competitors in the replacement needle market, rather than for improving the operation of the gun. *See In re IBM Peripheral EDP Devices Antitrust Litig.*, 481 F.Supp. 965, 1002 (N.D.Cal.1979), *aff'd sub. nom. Transamerica Computer Co. v. International Bus. Mach. Corp.*, 698 F.2d 1377 (9th Cir.1983); *see generally* 1 ABA, *Antitrust Law Developments* 286–87 (4th ed.1997). Bard argues that the evidence showed that absent patent protection for Bard's devices, M3 could still compete in the relevant market. While the evidence of Bard's market power was in dispute, the jury specifically found that Bard enjoyed monopoly power in the market for replacement needles. The evidence was sufficient to support the jury's verdict on that point and also to support the jury's conclusion that Bard maintained its monopoly position by exclusionary conduct, to wit, modifying its patented gun in order to exclude competing replacement needles.

The dissent on this issue starts from the premise that the modification to Bard's Biopty gun was an "improvement" and argues from that premise that to hold Bard liable for the modification would have the "pernicious" effect of penalizing innovators for making improvements to their products. The dissent's premise, however, is contrary to the jury's verdict, which was supported by the evidence. Although Bard contended at trial that it modified its Biopty gun to make it easier to load and unload, there was substantial evidence that Bard's real reasons for modifying the gun were to raise the cost of entry to potential makers of replacement needles, to make doctors apprehensive about using non-Bard needles, and to preclude the use of "copycat" needles. One internal Bard document showed that the gun modifications had no effect on gun or needle performance; another internal document showed that the use of non-Bard needles in the gun "could not possibly result in injury to either the patient or the physician." In view of that evidence, the jury could reasonably conclude that Bard's modifications to its guns constituted "restrictive or exclusionary conduct" in a market over which it had monopoly power.

The dissent also takes issue with the jury instructions, contending that they failed properly to frame a charge of predatory conduct that comports with established criteria of antitrust liability. Because Bard did not challenge the court's instructions, however, the legal sufficiency of the jury charge on the antitrust issues is not properly before us on appeal. To be entitled to relief based on asserted errors in the court's instructions to

the jury, Bard was required to challenge those instructions in this court and demonstrate that it timely objected to those instructions in the district court. Bard did neither, but instead based its argument entirely on the sufficiency of the evidence. Because the evidence is sufficient to support the verdict on the gun modification theory of liability, the jury's liability verdict must stand. *See Mangren Research & Dev. v. National Chem. Co.*, 87 F.3d 937, 942 n. 3 (7th Cir.1996); *Composite Marine Propellers, Inc. v. Van Der Woude*, 962 F.2d 1263, 1265 (7th Cir.1992).

B

While we affirm Bard's liability on the antitrust counterclaim, that does not necessarily mean that the jury's damage award of $1.5 million can be sustained. M3 presented evidence of three different markets (guns, guns and needles, and replacement needles) in which Bard allegedly caused antitrust injury, and the jury found Bard liable for injury in each market. The damages portion of the verdict, however, merely indicated a general award of $1.5 million without attribution to a particular market or exclusionary practice.

M3's evidence concerning Bard's gun modification program was relevant only to the replacement needle market. Because we have concluded that the evidence concerning Bard's activities in the other two markets cannot support antitrust liability, the question arises as to whether the $1.5 million damages award can be supported solely on the basis of the injury Bard's actions caused to M3 in the replacement needle market. That issue was not briefed on appeal, and the record, so far as we can ascertain, does not provide clear guidance as to the proper allocation of damages due to the injury suffered by M3 in the injury replacement needle market. Consequently, we vacate the antitrust damages award and remand to the district court to consider, after additional hearing or limited retrial, if necessary, the proper amount of damages attributable to Bard's gun modification program. *See MCI Communications Corp. v. American Tel. & Tel. Co.*, 708 F.2d 1081, 1166–67 (7th Cir.1983).

FULL TEXT OF CASES (USPQ2D)
All Other Cases

In re Geiger * (CA FC) 2 USPQ2d 1276 In re Geiger *

U.S. Court of Appeals Federal Circuit
2 USPQ2d 1276

Decided April 1, 1987
No. 86-1103

Headnotes

PATENTS

1. Patentability/validity -- Obviousness -- Evidence of (§ 115.0903)

Obviousness cannot be established by combining teachings of prior art to produce claimed invention, absent some teaching, suggestion, or incentive supporting combination, and thus, although it might have been obvious to one skilled in art to try various combinations of teachings of three prior art references to achieve claimed method, such evidence does not establish prima facie case of obviousness.

Particular Patents -- Corrosion inhibitor

Geiger, application No. 373,903, for method of inhibiting scale formation on and corrosion of metallic parts in cooling water systems, Claims 43-63, and 65-67, not obvious.

Case History and Disposition:

Appeal from United States Patent and Trademark Office, Board of Patent Appeals and Interferences.

Application for patent of Gary E. Geiger, application, Serial No. 373,903, from affirmation of rejection of claims, applicant appeals. Reversed; Newman, Circuit Judge, concurring with opinion.

Attorneys:

Bruce E. Peacock, Trevose, Pa., for appellant.

Robert D. Edmonds, associate solicitor (Joseph F. Nakamura, solicitor, and Fred E. McKelvey, deputy solicitor, with him on the brief), for appellee.

Judge:

Before Skelton, Senior Circuit Judge, and Newman and Archer, Circuit Judges.

Opinion Text

Opinion By:

Archer, Circuit Judge.

This is an appeal from a decision of the United States Patent and Trademark Office (PTO) Board of Patent Appeals and Interferences (board), Appeal No. 606-09, affirming the examiner's rejection of all remaining claims, 43-63 and 65-67, in appellant's patent application, Serial Number 373,903 ('903), under 35 U.S.C. §103. We reverse.

OPINION

Background

The '903 application, filed on May 3, 1982, is directed to a method of inhibiting scale formation on and corrosion of metallic parts in cooling water systems by use of compositions containing (1) a sulfonated styrene/maleic anhydride (SSMA) copolymer, (2) a water soluble zinc compound, and (3) an organo-phosphorus acid compound or water soluble salt thereof.

In its decision dated February 7, 1986, the board affirmed the examiner's rejections under 35 U.S.C. § 103, finding that the claimed subject matter would have been obvious in view of various combinations of references, but with reliance primarily upon U.S. Patent No. 4,209,398 issued to Ii, et al. (Ii), U.S. Patent No. 4,374,733 issued to Snyder, et al. (Snyder '733) and U.S. Patent No. 4,255,259 issued to Hwa, et al. (Hwa) 1

The Ii patent discloses use in cooling water systems of scale and corrosion prevention compositions comprised of a polymeric component in combination with one or more compounds selected from the group consisting of inorganic phosphoric acids and water soluble salts thereof, phosphonic acids and water soluble salts thereof, organic phosphoric acid esters and water soluble salts thereof, and polyvalent metal salts. Although the Ii polymeric component may contain maleic acid and styrene monomers, there is no disclosure of the specific copolymer, SSMA, required in applicant's claims.

The Snyder '733 patent discloses a method for treating cooling water systems prone to scale formation by the addition of a composition comprised of an acrylic acid/lower alkyl/hydroxy acrylate copolymer and another polymeric component, which may be SSMA or a styrene/maleic anhydride (SMA) copolymer. The Snyder '733 patent notes that boiler and cooling water systems share a common problem in regard to scale deposit formation and that use of SMA to prevent scale in boiler water systems is known.
The Hwa patent is directed to a method for treating boiler water systems that are prone to scale formation by addition of a composition comprised of SSMA and an organo-phosphorus acid compound.
The remaining references, cited with respect to certain dependent claims, contain no suggestion to use SSMA, the specific copolymer recited in the appealed claims.
Based upon the prior art and the fact that each of the three components of the composition

used in the claimed method is conventionally employed in the art for treating cooling water systems, the board held that it would have been prima facie obvious, within the meaning of 35 U.S.C. § 103, to employ these components in combination for their known functions and to optimize the amount of each additive. The board further held that data appearing in appellant's specification, and supplemented by a declaration submitted pursuant to 37 C.F.R. § 1.132, provided insufficient evidence of nonobviousness to rebut the prima facie case.

Issues

1. Whether the board erred in finding that a prima facie case of obviousness was established.
2. Assuming that a prima facie case of obviousness was established, whether the board erred in finding that appellant's objective evidence with regard to unexpected results was insufficient to rebut that prima facie case.

Analysis

Obviousness is a question of law based upon the factual inquiries mandated in *Graham v. John Deere Co* ., 383 U.S. 1, 148 USPQ 459 (1966). *Bausch & Lomb, Inc. v. Barnes-Hind/ Hydrocurve, Inc* .) 796 F.2d 443, 447, 230 USPQ 416, 419 (Fed. Cir. 1986). For a conclusion of obviousness, the standard of review is correctness or error as a matter of law. In re *Caveney* , 761 F.2d 671, 674, 226 USPQ 1, 3 (Fed. Cir. 1985); *In re DeBlauwe* , 736 F.2d 699, 703, 222 USPQ 191, 195 (Fed. Cir. 1984).
[1] Appellant contends that the PTO failed to establish a prima facie case of obviousness and, consequently, that the board's affirmance of the examiner's rejections was erroneous. Appellant argues that the PTO's position represented hindsight reconstruction or, at best, established that it would have been "obvious to try" various combinations of known scale and corrosion prevention agents, including the combination recited in the appealed claims.
We agree with appellant that the PTO has failed to establish a prima facie case of obviousness. Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital* , 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). We are convinced that the latter are not present here. Ii does not suggest use of SSMA as its claimed polymeric component and does not require the presence of an organophosphorus acid compound or of a zinc compound. Ii notes that it is difficult to maintain a predetermined concentration of polyvalent metal ions, such as the zinc (II) ion, in alkaline cooling water, but states that its claimed polymeric component prevents the "polyvalent metals from becoming insoluble compounds and precipitating. . . ." Although Snyder '733 discloses use of SSMA, it is for the purpose of showing that it, or one of three other specifically recited copolymers, may be used in combination with yet another polymeric component, an acrylic acid/lower alkyl/hydroxy acrylate copolymer, to prevent scale formation. With respect to claims 47 and 49, Hwa does disclose the specifically-recited organo-phosphorus acid compound. It provides, however, no

suggestion to add a zinc compound to its disclosed combination of SSMA and organ-ophosphorus acid compounds, or to use SSMA in combination with an organo-phosphorus acid compound in the treatment of a cooling water system, where the characteristics may significantly differ from those in Hwa's boiler water system. Hwa also provides no suggestion that SSMA could prevent precipitation of the zinc (II) ion in alkaline cooling water in the manner ascribed to the polymeric component of Ii.

At best, in view of these disclosures, one skilled in the art might find it obvious to try various combinations of these known scale and corrosion prevention agents. However, this is not the standard of 35 U.S.C. § 103. *In re Goodwin* , 576 F.2d 375, 377, 198 USPQ 1, 3 (CCPA 1978); *In re Antonie* , 559 F.2d 618, 195 USPQ 6 (CCPA 1977); *In re Tomlinson* , 363 F.2d 928, 150 USPQ 623 (CCPA 1966).

Because we reverse on the basis of failure to establish a *prima facie* case of obviousness, we need not reach the issue of the sufficiency of the showing of unexpected results.

REVERSED

Footnotes

Footnote 1. Hwa was cited only with respect to dependent claims 47 and 49.

Concurring Opinion Text

Concur By:

Newman, Circuit Judge, concurring.

I agree in the court's result, but respectfully do not share the view that the PTO did not present a prima facie case that the claimed invention would have been obvious in terms of 35 U.S.C. § 103. I write separately because the determination of whether a prima facie case of obviousness has been made is a critical decision that controls the evidentiary procedures and burdens before the PTO.

The claims are directed to a three-component system to control scale and corrosion in cooling water systems, the components being (1) zinc ions, (2) a copolymer of sulfonated styrene and maleic anhydride (SSMA), and (3) an organophosphorus acid or salt. A three-part system is described in the Ii reference for the same purpose, but differs from applicant's system in that the copolymer component (2) is different. There is no teaching of SSMA in the Ii reference. However, the Snyder '733 reference teaches SSMA in combination with other polymers to control scale in cooling water systems. The use of SSMA in cooperation with phosphonate is known to reduce scale and sludge in boilers (Hwa). Hwa does not use zinc ions and it is known that zinc ions produce undesirable results in boilers, but the Ii reference states that it was known to use zinc ions alone or in combination with organophophorus acids or salts to inhibit corrosion in cooling water.

Thus each of Geiger's three components has been described, separately or in partial combination, for use in cooling water systems. In my view, it would have been prima facie obvious to replace the polymer component of Ii with the known scale inhibitor SSMA, or to add an organophosphorus compound and zinc ions, both known corrosion inhibitors, to SSMA to achieve both scale and corrosion resistance in cooling water systems. *In re Kerkhoven* , 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980); *Minnesota Mining & Manufacturing Co. v. Ansul Co* ., 213 USPQ 1024, 1033-34 (E.D Wis. 1981). The Board so held.

The applicant, in rebuttal of the PTO's prima facie case, argued that his three [component systems exhibits superior

properties, and that the superiority was not obvious in view of the cited references. In support of this argument the applicant relied on experimental data in the specification.
The specification contains data on the corrosion/scale control capability of various combinations of components, including data comparing the applicant's three-part system containing SSMA with other three-part systems containing other preferred scale-preventing polymers of the prior art. These data showed significant superiority of applicant's system; this was not disputed. The Board nevertheless held that the prima facie case was not rebutted because the applicant did not include data showing the properties of SSMA alone, stating that "the superior performance of such compositions may be due to the superiority of SSMA vis-a-vis the other scale-Preventing copolymers."
I agree with the Board to the extent that it would have been of scientific interest to include such data. However, as a matter of law I believe that the applicant's showing was reasonable and sufficient. He complied with the requirement that the comparative showing "must be sufficient to permit a conclusion respecting the relative effectiveness of applicant's claimed compounds and the compounds of the closest prior art," *In re Payne* , 606 F.2d 303, 316, 203 USPQ 245, 256 (CCPA 1979), and must "provide an adequate basis to support a legal concluslon of unobviousness. *In re Johnson* , 747 F.2d 1456, 1461, 223 USPQ 1260, 1264 (Fed. Cir. 1984). The applicant demonstrated the exceptional corrosion inhibition achieved with his three-part system in comparison with systems containing the known corrosion inhibitors zinc ion and organophosphorus compounds. He also compared his combination with systems containing other known polymeric scale inhibitors such as those taught by Ii, and demonstrated that those systems did not provide the improvement in corrosion and scale control achieved with the SSMA combination. He also demonstrated that neither polymaleic anhydride nor sulfonated polystyrene had the same effect on corrosion resistance as did the SSMA copolymer.
Applicant compared his system with the most relevant prior art. It is not required that the claimed invention be compared with subject matter that does not exist in the prior art. The applicant is not required to create prior art, nor to prove that his invention would have been obvious if the prior art were different than it actually was.
The Board also upheld the examiner's additional rejection that it would have been obvious to add zinc ion to the two-component SSMA/phosphonate system of Hwa. The Hwa system is for the reduction of scale and sludge at the high temperatures of steam

boilers, and it was uncontroverted that zinc ion is not usable at high temperatures. Applicant provided data showing that the Hwa system is relatively ineffective in a cooling system. The Board did not contradict this position on its scientific merits.
The applicant compared SSMA/phosphonate (Hwa) alone, SSMA/zinc, and phosphonate/zinc, with his three-component system, and achieved results that the Board held showed "superior performance." These results are sufficient in themselves to rebut a prima facie case of obviousness. *See In re De Blauwe* , 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984).
Turning to the rejection on the breadth of the claim language, the limitations in the claims appear to be reasonably commensurate with the disclosure. Although I do not agree with the applicant that it is incumbent on the Commissioner to offer "technical evidence", applicant's specific examples are illustrative of the limitations described in the specification, and are not in themselves further limitations. *In re Johnson* , 558 F.2d 1008, 1017, 194 USPQ 187, 195 (CCPA 1977); *In re Goffe* , 542 F.2d 564, 567, 191 USPQ 429, 431 (CCPA 1976).

Footnote *. This opinion issued as an unpublished opinion on December 11, 1986. On request of counsel for

appellant, it is now being reissued as a published opinion.

- End of Case -

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FULL TEXT OF CASES (USPQ2D)
All Other Cases

In re Fine (CA FC) 5 USPQ2d 1596 In re Fine

U.S. Court of Appeals Federal Circuit
5 USPQ2d 1596

Decided January 26, 1988
No. 87-1319

Headnotes

PATENTS

1. Patentability/Validity -- Obviousness -- Evidence of (§ 115.0903)

Patent and Trademark Office improperly rejected claimed invention for obviousness since nothing in cited references, either alone or in combination, suggests or teaches claimed invention, since there is consequently no support for PTO's conclusion that substitution of one type of detector for another in prior art system, resulting in claimed invention, would have been obvious, and since PTO therefore failed to satisfy its burden of establishing prima facie case of obviousness by showing some objective teaching or generally available knowledge that would lead one skilled in art to combine teachings of existing references.

2. Patentability/Validity -- Obviousness -- In general (§ 115.0901)

Obviousness is tested by what combined teachings of prior art references would have suggested to those of ordinary skill in art, not by whether particular combination of elements from such references might have been "obvious to try."

3. Patentability/Validity -- Obviousness -- Evidence of (§ 115.0903)

Patent and Trademark Office erred, in rejecting as obvious system for detecting and measuring minute quantities of nitrogen compounds, by failing to recognize that appealed claims can be distinguished over combination of prior art references, in view of evidence demonstrating that prior art does not teach claimed temperature range, despite some overlap of preferred temperature ranges for claimed invention and prior art, since purposes of preferred temperature ranges are different and overlap is mere happenstance.

4. Patentability/Validity -- Obviousness -- In general (§ 115.0901)

Dependent claims are non-obvious under 35 USC 103 if claims from which they depend are non-obvious.

Case History and Disposition:

Appeal from the U.S. Patent and Trademark Office Board of Patent Appeals and Interferences.

Application for patent by David H. Fine, Serial No. 512,374. From decision of Board of Patent Appeals and Interferences affirming rejection of application, applicant appeals. Reversed; Smith, circuit judge, dissenting with opinion.

Attorneys:

Morris Relson and Darby & Darby, New York, N.Y., (Beverly B. Goodwin with them on the brief) for appellant.

Lee E. Barrett, associate solicitor, Arlington, Va., (Joseph F. Nakamura, solicitor, and Fred E. McKelvey, deputy solicitor, with him on the brief) for appellee.

Judge:

Before Friedman, Smith, and Mayer, circuit judges.

Opinion Text

Opinion By:

Mayer, J.

David H. Fine appeals from a decision of the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office (Board) affirming the rejection of certain claims of his application, Serial No. 512,374, and concluding that his invention would have been obvious to one of ordinary skill in the art and was therefore

unpatentable under 35 U.S.C. §103. We reverse.

Background

A. *The Invention*.

The invention claimed is a system for detecting and measuring minute quantities of nitrogen compounds. According to Fine, the system has the ability to detect the presence of nitrogen compounds in quantities as minute as one part in one billion, and is an effective means to detect drugs and explosives, which emanate nitrogen compound vapors even when they are concealed in luggage and closed containers.

The claimed invention has three major components: (1) a gas chromatograph which separates a gaseous sample into its constituent parts; (2) a converter which converts the nitrogen compound effluent output of the chromatograph into nitric oxide in a hot, oxygen-rich environment; and (3) a detector for measuring the level of nitric oxide. The claimed invention's sensitivity is achieved by combining nitric oxide with ozone to produce nitrogen dioxide which concurrently causes a detectable luminescence. The luminescence, which is measured by a visual detector, shows the level of nitric oxide which in turn is a measure of nitrogen compounds found in the sample.

The appealed claims were rejected by the Patent and Trademark Office (PTO) under 35 U.S.C. §103. Claims 60, 63, 77 and 80 were rejected as unpatentable over Eads, Patent No. 3,650,696 (Eads) in view of Warnick, et al., Patent No. 3,746,513 (Warnick). Claims 62, 68, 69, 79, 85 and 86 were rejected as unpatentable over Eads and Warnick in view of Glass, et al., Patent No. 3,207,585 (Glass).

B. *The Prior Art*.

1. *Eads Patent*.

Eads discloses a method for separating, identifying and quantitatively monitoring sulfur compounds. The Eads system is used primarily in "air pollution control work in the scientific characterization of odors from sulfur compounds."

The problem addressed by Eads is the tendency of sulfur compounds "to adhere to or react with the surface materials of the sampling and analytical equipment, and/or react with the liquid or gaseous materials in the equipment." Because of this, the accura

cy of measurement is impaired. To solve the problem, the Eads system collects an air sample containing sulfur compounds in a sulfur-free methanol solution. The liquid is inserted into a gas chromatograph which separates the various sulfur compounds. The compounds are next sent through a pyrolysis furnace where they are oxidized to form sulfur dioxide. Finally, the sulfur dioxide passes through a measuring device called a microcoulometer which uses titration cells to calculate the concentration of sulfur compounds in the sample.

2. *Warnick Patent*.

Warnick is directed to a means for detecting the quantity of pollutants in the atmosphere. By measuring the chemiluminescence of the reaction between nitric oxide and ozone, the Warnick device can detect the concentration of nitric oxide in a sample gaseous mixture.

Warnick calls for "continuously flowing" a sample gaseous mixture and a reactant containing ozone into a reaction chamber. The chemiluminescence from the resulting reaction is transmitted through a light-transmitting element to produce continuous readouts of the total amount of nitric oxide present in the sample.

3. Glass Patent.

The invention disclosed in Glass is a device for "completely burning a measured amount of a substance and analyzing the combustion products." A fixed amount of a liquid petroleum sample and oxygen are supplied to a flame. The flame is then spark-ignited, causing the sample to burn. The resulting combustion products are then collected and measured, and from this measurement the hydrogen concentration in the sample is computed.

C. *The Rejection.*

The Examiner rejected claims 60, 63, 77 and 80 because "substitution of the [nitric oxide] detector of Warnick for the sulfur detector of Eads would be an obvious consideration if interested in nitrogen compounds, and would yield the claimed invention." He further asserted that "Eads teaches the [claimed] combination of chromatograph, combustion, and detection, in that order. . . . Substitution of detectors to measure any component of interest is well within the skill of the art." In rejecting claims 62, 68, 69, 79, 85 and 86, the Examiner said, "Glass et al. teach a flame conversion means followed by a detector, and substitution of the flame conversion means of Glass et al. for the furnace of Eads would be an obvious equivalent and would yield the claimed invention." The Board affirmed the Examiner's rejection.

Discussion

A. *Standard of Review.*

Obviousness under 35 U.S.C. §103 is " 'a legal conclusion based on factual evidence.' " *Stratoflex, Inc. v. Aeroquip Corp .*, 713 F.2d 1530, F.2d 1530, 1535, 218 USPQ 871, 876 (Fed. Cir. 1983) (quoting *Stevenson v. Int'l Trade Comm'n* , 612 F.2d 546, 549, 204 USPQ 276, 279 (CCPA 1979)). Therefore, an obviousness determination is not reviewed under the clearly erroneous standard applicable to fact findings, *Raytheon Co. v. Roper Corp .*, 724 F.2d 951, 956, 220 USPQ 592, 596 (Fed. Cir. 1983); it is "reviewed for correctness or error as a matter of law." *In re De Blauwe* , 736 F.2d 699, 703, 222 USPQ 191, 195 (Fed. Cir. 1984).

To reach a proper conclusion under §103, the decisionmaker must step backward in time and into the shoes worn by [a person having ordinary skill in the art] when the invention was unknown and just before it was made. In light of *all* the evidence, the decisionmaker must then determine whether . . . the claimed invention as a whole would have been obvious at *that* time to *that* person. 35 U.S.C. §103. The answer to that question partakes more of the nature of law than of fact, for it is an ultimate conclusion based on a foundation formed of all the probative facts.

Panduit Corp. v. Dennison Mfg. Co ., 810 F.2d 1561, 1566, 1 USPQ2d 1593, 1595-96 (Fed. Cir. 1987).

B. *Prima Facie Obviousness.*

Fine says the PTO has not established a *prima facie* case of obviousness. He contends the references applied by the Board and Examiner were improperly combined, using hindsight reconstruction, without evidence to support the combination and in the face of contrary teachings in the prior art. He argues that the appealed claims were rejected because the PTO thought it would have been "obvious to try" the claimed invention, an unacceptable basis for rejection.

[1] We agree. The PTO has the burden under section 103 to establish a *prima facie* case of obviousness. *See In re Piasecki* , 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-87 (Fed. Cir. 1984). It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. *In re Lalu* , 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1984); *see also Ashland Oil, Inc. v. Delta Resins & Refractories, Inc .*,

776 F.2d 281, 297 n.24, 227 USPQ 657 , 667 n.24 (Fed. Cir. 1985); *ACS Hosp. Sys., Inc. v. Montefiore Hosp .*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). This it has not done. The Board points to nothing in

the cited references, either alone or in combination, suggesting or teaching Fine's invention.
The primary basis for the Board's affirmance of the Examiner's rejection was that it would have been obvious to substitute the Warnick nitric oxide detector for the Eads sulfur dioxide detector in the Eads system. The Board reiterated the Examiner's bald assertion that "substitution of one type of detector for another in the system of Eads would have been within the skill of the art," but neither of them offered any support for or explanation of this conclusion.
Eads is limited to the analysis of sulfur compounds. The particular problem addressed there is the difficulty of obtaining precise measurements of sulfur compounds because of the tendency of sulfur dioxide to adhere to or react with the sampling analytic equipment or the liquid or gaseous materials in the equipment. It solves this problem by suggesting that the gaseous sample containing sulfur compounds be absorbed into sulfur-free methanol and then inserted into a gas chromatograph to separate the sulfur compounds.
There is no suggestion in Eads, which focuses on the unique difficulties inherent in the measurement of sulfur, to use that arrangement to detect nitrogen compounds. In fact, Eads says that the presence of nitrogen is undesirable because the concentration of the titration cell components in the sulfur detector is adversely affected by substantial amounts of nitrogen compounds in the sample. So, instead of suggesting that the system be used to detect nitrogen compounds, Eads deliberately seeks to avoid them; it warns against rather than teaches Fine's invention. *See W. L. Gore & Assoc. v. Garlock, Inc* ., 721 F.2d 1540, 1550, 220 USPQ 303, 311 (Fed. Cir. 1983) (error to find obviousness where references "diverge from and teach away from the invention at hand"). In the face of this, one skilled in the art would not be expected to combine a nitrogen-related detector with the Eads system. Accordingly, there is no suggestion to combine Eads and Warnick.
Likewise, the teachings of Warnick are inconsistent with the claimed invention, to some extent. The Warnick claims are directed to a gas stream from engine exhaust "continuously flowing the gaseous mixtures into the reaction chamber" to obtain "continuous readouts" of the amount of nitric oxide in the sample. The other words, it contemplates measuring the total amount of nitric oxide in a continuously flowing gaseous mixture of unseparated nitrogen constituents. By contrast, in Fine each nitrogen compound constituent of the gaseous sample is retained in the Chromatograph for an individual time period so that each exists in discrete, time-separated pulses. * By this process, each constituent may be both identified by its position in time sequence, and measured. The claimed system, therefore, diverges from Warnick and teaches advantages not appreciated or contemplated by it.
Because neither Warnick nor Eads, alone or in combination, suggests the claimed invention, the Board erred in affirming the Examiner's conclusion that it would have been obvious to substitute the Warnick nitric oxide detector for the Eads sulfur dioxide detector in the Eads system. *ACS Hosp. Sys* ., 732 F.2d at 1575-77, 221 USPQ at 931-33. The Eads and Warnick references disclose, at most, that one skilled in the art might find it obvious to try the claimed invention. But whether a particular combination might be "obvious to try" is not a legitimate test of patentability. *In re Geiger* , 815 F.2d 868, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987); *In re Goodwin* , 576 F.2d 375, 377, 198 USPQ 1, 3 (CCPA 1978).
[2] Obviousness is tested by "what the combined teachings of the references would have suggested to those of ordinary skill in the art." *In re Keller* , 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). But it "cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." *ACS Hosp. Sys* ., 732 F.2d at 1577, 221 USPQ at 933. And "teachings of references can be combined *only* if there is some suggestion or incentive to do so." *Id* . Here, the prior art contains none.
Instead, the Examiner relies on hindsight in reaching his obviousness determination.

But this court has said, "To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect

of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." *W. L. Gore* , 721 F.2d at 1553, 220 USPQ at 312-13. It is essential that "the decisionmaker forget what he or she has been taught at trial about the claimed invention and cast the mind back to the time the invention was made . . . to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art." *Id* . One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

C. *Advantage Not Appreciated by the Prior Art* .

[3] The Board erred not only in improperly combining the Eads and Warnick references but also in failing to appreciate that the appealed claims can be distinguished over that combination. A material limitation of the claimed system is that the conversion to nitric oxide occur in the range of 600°C to 1700°C. The purpose of this limitation is to prevent nitrogen from other sources, such as the air, from being converted to nitric oxide and thereby distorting the measurement of nitric oxide derived from the nitrogen compounds of the sample.
The claimed nitric oxide conversion temperature is not disclosed in Warnick. Although Eads describes a preferred temperature of 675°C to 725°C, the purpose of this range is different from that of Fine. Eads requires the 675°C to 725°C range because it affords a temperature low enough to avoid formation of unwanted sulfur trioxide, yet high enough to avoid formation of unwanted sulfides. Fine's temperature range, in contrast, does not seek to avoid the formation of sulfur compounds or even nitrogen compounds. It enables the system to break down the nitrogen compounds of the sample while avoiding the destruction of background nitrogen gas. There is a partial overlap, of course, but this is mere happenstance. Because the purposes of the two temperature ranges are entirely unrelated, Eads does not teach use of the claimed range. *See In re Geiger* , 815 F.2d at 688, 2 USPQ2d at 1278. The Board erred by concluding otherwise.

D. *Unexpected Results* .

Because we reverse for failure to establish a *prima facie* case of obviousness, we need not reach Fine's contention that the Board failed to accord proper weight to the objective evidence of unexpected superior results. *Id* .

E. *The "Flame" Claims* .

[4] Claims 62, 68, 69, 79, 85 and 86 relate to the oxygen-rich flame conversion means of the claimed invention. These "flame" claims depend from either apparatus claim 60 or method claim 77. Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious. *Hartness Int'l, Inc. v. Simplimatic Eng'g Co* ., 819 F.2d 1100, 1108, 2 USPQ2d 1826, 1831 (Fed. Cir. 1987); *In re Abele* , 684 F.2d 902, 910, 214 USPQ 682, 689 (CCPA 1982); *see also In re Sernaker* , 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983). In view of our conclusion that claims 60 and 77 are nonobvious, the dependent "flame" claims are also patentable.

Conclusion

The Board's decision affirming the Examiner's rejection of claims 60, 62, 63, 68, 69, 77, 79, 80, 85 and 86 of Fine's application as unpatentable over the prior art under 35 U.S.C. §103 is *REVERSED* .

Footnotes

Footnote *. The Solicitor argues that the contents of Attachment C of Fine's brief were not before the Board and may not properly be considered here. However, we need not rely on Attachment C. It is merely illustrative of the qualitative separation of nitrogen compounds which occurs in Fine's system. The fact that the various constituents exit at discrete intervals is shown by the specification which was before the Board and which may appropriately be

considered on appeal. *See, e.g., Astra-Sjuco, A.B. v. United States Int'l Trade Comm'n* , 629 F.2d 682, 686, 207 USPQ 1, 5 (CCPA 1980) (claims must be construed in light of specification).

Dissenting Opinion Text

Dissent By:

Smith, circuit judge, dissenting.

I respectfully dissent. I am of the firm belief that the prior art references, relied upon by the PTO to establish its prima facie case of obviousness, in combination teach and suggest Fine's invention to one skilled in the art. Also, I firmly believe that Fine failed to rebut the PTO's prima facie case. On this basis, I would affirm the board's determination sustaining the examiner's rejection, pursuant to 35 U.S.C. §103, of Fine's claims on appeal before this court.

- End of Case -

FULL TEXT OF CASES (USPQ2D)
All Other Cases

In re Fritch (CA FC) 23 USPQ2d 1780 In re Fritch

U.S. Court of Appeals Federal Circuit
23 USPQ2d 1780

Decided August 11, 1992
No. 91-1318

Headnotes

JUDICIAL PRACTICE AND PROCEDURE

1. Procedure -- Judicial review -- Standard of review -- Patents (§ 410.4607.09)

Obviousness determination is based on underlying factual inquiries concerning claimed invention and prior art, which are reviewed for clear error on appeal, but ultimate conclusion of obviousness is reviewed as matter of law.

PATENTS

2. Patent construction -- Claims -- Broad or narrow (§ 125.1303)

Prior art patent for grass edging and watering device cannot be held to teach that device is flexible and conformable to ground in its entirety, since base portion of device includes prominent anchoring leg which would inhibit longitudinal flexibility, and since patent's express teaching that trench is necessary to install device in harder ground shows that it is not freely conformable thereto.

3. Patentability/Validity -- Obviousness -- Relevant prior art -- Particular inventions (§ 115.0903.03)

Patentability/Validity -- Obviousness -- Combining references (§ 115.0905)

Claims for landscape edging device are not prima facie obvious in view of combined teachings of two prior patents, since primary reference does not suggest overall flexibility and landscape retention function of claimed device, and since secondary reference does not, merely by virtue of flexibility of device described therein, suggest extensive modifications which would bring primary reference into conformity with application claims.

4. Patentability/Validity -- Obviousness -- Combining references (§ 115.0905)

Mere fact that prior art may be modified to reflect features of claimed invention does not make modification, and hence claimed invention, obvious unless desirability of such modification is suggested by prior art; claimed invention cannot be used as instruction manual or "template" to piece together teachings of prior art so that claimed invention is rendered obvious.

Case History and Disposition:

Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Patent application of John R. Fritch (serial no. 06/838,721, landscape apparatus and method). From decision upholding rejection of application claims 1-7, 9-24, 29 and 30, applicant appeals. Reversed.

Attorneys:

Charles L. Gholz, of Oblon, Spivak, McClelland, Maier & Neustadt, Arlington, Va. (John R. Fritch, Corpus Christi, Texas, on brief), for appellant.

Jameson Lee, associate solicitor (Fred E. McKelvey, solicitor, with him on brief; Richard E. Schafer, of counsel), for appellee.

Judge:

Before Smith, senior circuit judge, and Plager and Rader, circuit judges.

Opinion Text

Opinion By:
Smith, J.

John R. Fritch (Fritch) appeals the 27 February 1991 decision of the Patent and Trademark Office Board of Patent Appeals and Interferences (Board) affirming-in-part the Examiner's final rejection of the remaining claims in Fritch's application entitled Landscape Edging Apparatus and Method. 1 The Examiner concluded that Fritch's invention would have been obvious to one of ordinary skill in the art and was therefore unpatentable under 35 U.S.C. Section 103. The Board, except for allowing claim 28, agreed. The Board's decision is reversed.

Issue

The issue is whether the Board erred in affirming the Examiner's determination that the prior art references of Wilson and Hendrix rendered

the subject matter of Fritch's independent claims 1, 13, 24, and 29 obvious to one of ordinary skill in the art.

Background

In his final rejection, the Examiner rejected claims 1-24 and 27-30 of Fritch's application as unpatentable for obviousness under 35 U.S.C. Section 103. Fritch appealed the final rejection to the Board. The Board affirmed the rejection as to claims 1-24, 29 and 30, entered a new ground of rejection for claim 27, and reversed as to claim 28. The Board agreed with the Examiner that the teachings of the Wilson and Hendrix patents rendered the subject matter of independent claims 1, 13, 24, and 29 obvious to one of ordinary skill in the art. Fritch does not appeal the Board's disposition as to claims 27 and 28, and at oral argument withdrew the appeal as to claim 8. The claims remaining in this appeal are 1-7, 9-24, 29 and 30.

The Fritch Invention

The invention claimed by Fritch involves a landscape edging device which includes a planar base portion and an upwardly extending retainer portion. The base portion is elongate, thin, flexible and has a planar bottom surface conformable to a varying slope ground surface. One longitudinal edge of the base portion serves as a mowing strip and the other serves as a retaining flange for landscape fill. The upwardly extending retainer portion is integrally connected (e.g., fused) to the base portion and defines a longitudinally extending enclosed space. The Fritch invention is intended to be used as a retainer for landscape fill in order to separate unmowable landscape fill from the mowable lawn. It may also be used to secure a landscaping sheet to the ground, or to function as guards at the base of a fence. Independent claims 1 and 13 on appeal are representative of the subject matter claimed:

1. A landscape edging strip formed in its entirety of a thin gauge, flexible material and conformable to a ground surface of varying slope, comprising a continuous elongate, thin gauge, flexible base portion having a planar bottom surface conformable to said varying slope ground surface; a thin gauge, elongate retainer portion integral with said base portion and extending upwardly therefrom and transversely thereover to overlie a portion of said base portion; all of said retainer portion defining a longitudinally extending enclosed space; said retainer portion being integrally connected to said base portion adjacent one longitudinal edge of said base portion to define a mowing strip adjacent the other longitudinal edge of said base portion.

* * * * *

13. A landscape edging strip formed in its entirety from thin gauge, flexible material and conformable to a ground surface of varying slope, comprising a continuous elongate, thin gauge, flexible base portion having a

planar bottom surface conformable to said varying slope ground surface; a thin gauge, elongate retainer portion integral with said base port ion and extending upwardly therefrom and transversely thereover to overlie a portion of said base portion; all of said retainer portion defining a longitudinally extending enclosed space; said retainer portion being integrally connected to said base portion at a transverse location between the longitudinal edges of said base portion, thereby defining a longitudinally extending retaining flange on one side of said retainer portion and a mowing strip on the other side of said retainer portion.

* * * * * The critical language in Fritch's independent claims is that the device is to be, in its entirety, both flexible and "conformable to a ground surface of varying slope". These limitations, although located in the claims' preambles, "are necessary to give meaning to the claim [s] and properly define the invention". 2 Figure 1 from Fritch's drawings is reproduced below:

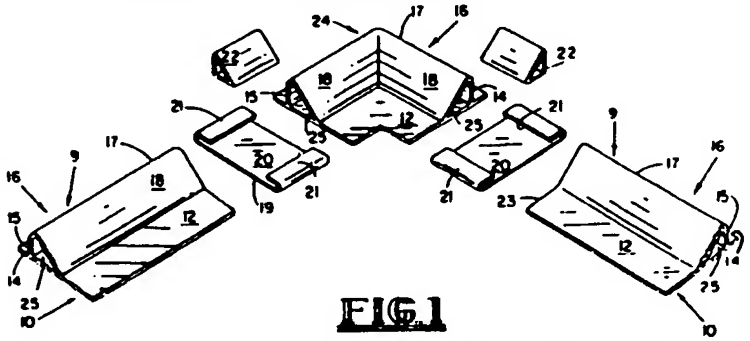

FIG.1

The Prior Art a. The Wilson Patent

The Wilson patent relied upon by the Examiner and the Board is entitled "Grass Edging and Watering Device". 3 The embodiment of the Wilson device includes a substantially flat mowing strip extending horizontally from a longitudinally extending body portion. Opposite the mowing strip is a scored flange which may be broken off when not needed or wanted. Between the mowing strip and the flange, and extending vertically from the body portion is an anchoring leg. Located above the anchoring leg is the body portion which contains a water conduit and sprinkler head assembly. The device is intended to be used adjacent to the borders of walks and plant beds. Figures 1 and 4 from Wilson's drawings are reproduced below:

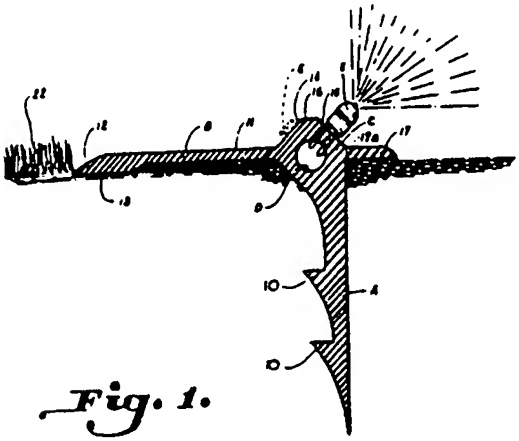

Fig. 1.

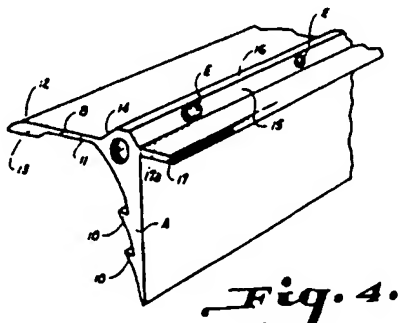

Fig. 4.

b. The Hendrix Patent

The Hendrix patent is entitled "Loose Material Retainer Strip". 4 The Solicitor chose not to discuss the Hendrix reference in his brief, stating that the Board had deemed Hendrix unnecessary to its decision. The Solicitor overstates the Board's position. The Board based its decision upon "a collective evaluation of the Wilson and Hendrix patents". We include Hendrix in our discussion because it did play a role in the rejection of Fritch's

independent claims.

The Hendrix device is composed of elongated, flexible strips having substantially C-shaped cross-section. The bottom lip of the device is to be wider than the top lip in order to facilitate fastening the device to the ground. The device will fit most gentle contours, and the top lip will yield laterally to build-up of gravel until the gravel can be redistributed. The concave portion of the strip is installed such that it faces the material to be retained in place. Hendrix contemplates that the retainer will be used in retaining gravel in driveways, lining flower beds, or on the shoulders of asphalt or concrete highways. Figure 1 of Hendrix's drawings is reproduced below:

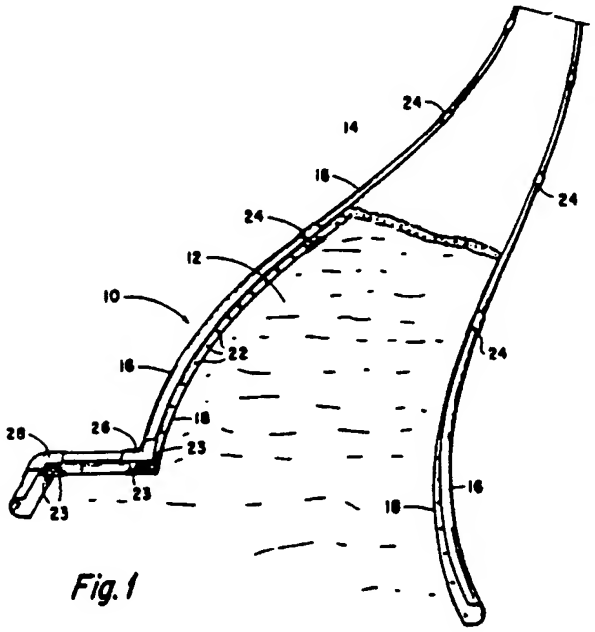

Fig. 1

Standard of Review

[1] " [O]bviousness is a question of law to be determined from the facts."5 The obviousness determination "is based upon underlying factual inquiries concerning the claimed invention and the prior art" which are reviewed for clear error. 6 However, it is the ultimate conclusion of obviousness which the Federal Circuit reviews as a matter of law.7

Teachings of Wilson

Fritch takes exception to the Examiner's findings of fact related to the teachings of the Wilson patent. The Examiner's rejection and the Board's opinion rely heavily on the use of Wilson in view of other references to declare the Fritch invention obvious. The Board states that it agrees with the Examiner's finding of fact regarding the teachings of Wilson. In the Examiner's answer, which the Board quotes, the Wilson device is described as follows:

Wilson discloses a landscaping edging strip comprising a relatively thin gauge, elongated flexible base portion including a mower strip B having a planar bottom surface conformable to a varying slope surface.

The Board states that the Wilson reference presents "substantial evidence that Wilson is both thin and flexible." The Board regards the Wilson device as teaching that it is flexible and conformable in its entirety. This finding demonstrates clear error.

[2] It is well settled that a prior art reference is relevant for all that it teaches to those of ordinary skill in the art. 8 The base portion of Wilson is not planar in its entirety, as the Board's opinion suggests, but also includes a

prominent anchoring leg to secure the device to the ground. The anchoring leg, which runs the length of the Wilson device, would inhibit longitudinal flexibility of the Wilson device. Indeed, Wilson expressly contemplates flexibility and conformability *only* in the mower strip. Wilson states that its mower strip may be lifted in order to pack dirt thereunder for the purpose of securing the device to the ground. Fritch, on the other hand, is claimed to be flexible in its entirety.

The Board's holding that Wilson is flexible in its entirety is based upon a misapprehension of the scope of Wilson's teachings.

Second, Wilson's anchoring leg prohibits conformability to the ground surface in the manner claimed by Fritch. The Examiner's description of Wilson as having a "planar bottom surface conformable to a varying slope surface" is applicable *only* in reference to the mower strip. This description, however, ignores the anchor leg and the fact that it must be placed *into* the ground. Wilson expressly teaches that the anchoring leg may be pushed into soft soils, but in harder terrain a trench is needed in order to place the Wilson sprinkler system. In order to install the Wilson apparatus, the ground surface must be altered to conform to the device rather than, as the Solicitor contends, that Wilson is freely conformable to the ground. Fritch, on the other hand, does not require such extensive alteration of the ground surface in order to install the device.

Prima Facie Obviousness

In proceedings before the Patent and Trademark Office, the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art.9 " [The Examiner] can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." 10 The patent applicant may then attack the Examiner's prima facie determination as improperly made out, or the applicant may present objective evidence tending to support a conclusion of nonobviousness." 11

Fritch has attacked the Board's finding that the Examiner established that Fritch's claimed invention was prima facie obvious in view of the teachings of the prior art. The Board states that "a collective evaluation of the Wilson and the Hendrix patents would have rendered the subject matter of independent claims 1, 13, 24, and 29 obvious to one of ordinary skill." Fritch maintains that there is no teaching, suggestion, or incentive in the prior art to modify or to combine the teachings of the prior art in the manner suggested by the Examiner. We agree.

[3] Wilson teaches a grass edging and watering device which includes an anchoring leg for securing the device to the ground. Wilson contemplates that a trench will need to be dug in order to allow the anchoring leg to be placed into the ground if the condition of the soil requires it. This anchoring leg prohibits flexibility and conformability over the length of Wilson. Any flexibility or conformability in Wilson, which the Board states extends to the entire device, is limited to the mower strip. It is only the mower strip that is mentioned as being flexible in order to aid installation. Hendrix has been cited for its teaching of a flexible retainer strip that is able to conform to the ground surface.

Wilson addresses the problems of arresting growth of grass between areas and watering plants without wetting sidewalks. Wilson lacks any suggestion or incentive to use its water conduit as a landscape retainer since this would arguably result in clogged sprinkler heads. 12 Wilson also teaches that its mower strip is flexible in order to allow dirt to be packed thereunder. There is no suggestion in Wilson to extend that flexibility to the entire device. Wilson also lacks any teaching or suggestion that one should remove the anchoring leg. Hendrix does not, simply by virtue of its flexible nature, suggest these extensive changes which the Board states are obvious. Neither Wilson nor Hendrix, alone or in combination, provide any incentive to combine the teachings of the prior art in the manner maintained by the Board.

[4] "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed

invention, absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined *only* if there is some suggestion or incentive to do so." 13 Although couched in terms of combining teachings found in the prior art, the same inquiry must be carried out in the context of a purported obvious "modification" of the prior art. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested

the desirability of the modification. 14 Wilson and Hendrix fail to suggest any motivation for, or desirability of, the changes espoused by the Examiner and endorsed by the Board.

Here, the Examiner relied upon hindsight to arrive at the determination of obviousness. It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. 15 This court has previously stated that " [o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." 16

Conclusion

The decision of the Board affirming the Examiner's rejection of independent claims 1, 13, 24, and 29 of Fritch's application as unpatentable over the prior art under 35 U.S.C. Section 103 is reversed. Since dependent claims are nonobvious if the independent claims from which they depend are nonobvious, the Board's affirmance of the rejection of dependent claims 2-7, 9-12, 14-23, and 30 is also reversed.17

REVERSED

Footnotes

Footnote 1. Serial No. 06/838,721.

Footnote 2. *Perkin Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 896, 221 USPQ 669, 675 (Fed. Cir. 1984).

Footnote 3. U.S. Patent No. 3,485,449.

Footnote 4. U.S. Patent No. 4,349,596.

Footnote 5. *In re De Blauwe*, 736 F.2d 699, 703, 222 USPQ 191, 195 (Fed. Cir. 1984).

Footnote 6. *In re Kulling*, 897 F.2d 1147, 1149, 14 USPQ2d 1056, 1057 (Fed. Cir. 1990).

Footnote 7. *In re De Blauwe*, 736 F.2d at 703, 222 USPQ at 195.

Footnote 8. *Beckman Instruments Inc. v. LKB Produkter AB* , 892 F.2d 1547, 1551, 13 USPQ2d 1301, 1304 (Fed. Cir. 1989).

Footnote 9. *In re Piasecki*, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984).

Footnote 10. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988) (citing *In re Lalu*, 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1988)).

Footnote 11. *In re Heldt*, 433 F.2d 808, 811, 167 USPQ 676, 678 (CCPA 1970).

Footnote 12. This court has previously found a proposed modification inappropriate for an obviousness inquiry when the modification rendered the prior art reference inoperable for its intended purpose. *In re Gordon* , 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

Footnote 13. *ACS Hosp. Systems, Inc. v. Montefiore Hosp* ., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984).

Footnote 14. *In re Gordon*, 733 F.2d at 902, 221 USPQ at 1127.
Footnote 15. *In re Gorman*, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). *See also Interconnect Planning Corp. v. Feil* , 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985).
Footnote 16. *In re Fine*, 837 F.2d at 1075, 5 USPQ2d at 1600.
Footnote 17. *In re Fine*, 837 F.2d at 1076, 5 USPQ2d at 1600 (citing *Hartness Int'l, Inc. v. Simplimatic Eng'g Co.* , 819 F.2d 1100, 1108, 2 USPQ2d 1826, 1831 (Fed. Cir. 1987)). *See also In re Sernaker* , 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983) (when argued together, dependent claims stand or fall with the independent claims from which they depend).

- End of Case -

FULL TEXT OF CASES (USPQ FIRST SERIES)

In re RATTI

(CCPA)
123 USPQ 349
Decided Sept. 30, 1959
Appl. No. 6452
U.S. Court of Customs and Patent Appeals

Headnotes

PATENTS

1. Evidence—Judicial notice (§ 36.20)

It is common knowledge that resilient deformable materials such as natural or synthetic rubber are incompressible, i.e., while they may be deformed, this can occur only if design and mounting of part permits resilient material to change its shape in response to applied forces.

2. Patentability — Anticipation — Combining references (§ 51.205)

Patentability — Anticipation — Modifying references (§ 51.217)

Combination of J patent with C patent is not proper ground for rejection of claims since combination would require substantial reconstruction and redesign of elements shown in C as well as change in basic principles under which C construction was designed to operate; once applicant taught how this could be done, redesign may, by hindsight, seem to be obvious to one having ordinary skills in art, but, when viewed as of time applicant's invention was made, and without benefit of applicant's disclosure, court finds nothing in art of record which suggests applicant's novel device.

3. Court of Customs and Patent Appeals—Issues determined—Ex parte patent cases (§ 28.203)

Rejection reversed by Board is not before court.

4. Patentability—In general (§ 51.01)

Novelty alone is not enough for patentability.

5. Patent grant—In general (§ 50.01)
Applicant is entitled to patent, under the statutes, unless one of the prohibitory provisions of statutes applies.

6. Patentability—In general (§ 51.01)

Patentability—Evidence of—In general (§ 51.451)

Patentability—Utility (§ 51.75)
Statutory requirements for patentability are novelty, usefulness, and unobviousness, as provided in 35 U.S.C. 101, 102, and 103; while proof that invention is better or possesses advantages may be persuasive of existence of any one or all of the requirements, and hence be indicative of patentability, Congress has not made such proof a prerequisite to patentability; moreover, Congress has never required that each and every patentable invention involve "progress" in the sense that it must possess some definite advantage over prior art; hence, it is improper to reject claim on ground that it does not possess some definite advantage over prior art; whileR.S. 4893 may be said to have given Commissioner some discretion in refusing to grant patent on an otherwise patentable invention unless "the same is sufficiently useful and important," Congress removed this provision from new 35 U.S.C. 131; this is further indication that it is intent of Congress that patentability be determined solely by sections 101, 102, and 103.

7. Court of Customs and Patent Appeals—In general (§ 28.01)

Pleading and practice in Patent Office—In general (§ 54.1)
It is duty of Patent Office and Court of Customs and Patent Appeals to apply law as Congress wrote it.

Particular patents—Oil Seal
Ratti, Oil Seal, claims 1, 4, 7, and 10 of application allowed.

Case History and Disposition:

Appeal from Board of Appeals of the Patent Office.
Application for patent of Ferdinand J. Ratti, Serial No. 359,325, filed June 3, 1953; Patent Office Division 52. From decision rejecting claims 1, 4, 7, and 10, applicant appeals. Reversed; Kirkpatrick, Judge, dissenting with opinion in which Worley, Chief Judge, joins.
Attorneys:
CROMWELL, GREIST & WARDEN (RAYMOND L. GREIST of counsel) both of Chicago, Ill., for appellant.

CLARENCE W. MOORE (S. WM. COCHRAN of counsel) for Commissioner of Patents.

Judge:

Before WORLEY, Chief Judge, RICH, MARTIN, and SMITH, Associate Judges, and KIRKPATRICK, Judge *.

Opinion Text

Opinion By:

SMITH, Judge.

This is an appeal from the decision of the Board of Appeals of the United States Patent Office affirming the rejection by the Primary Examiner of claims 1, 4, 7 and 10 of appellant's application serial No. 359,325, filed June 3, 1953, for a patent on an "Oil Seal" for sealing the space between a bore in a housing and a relatively movable shaft centrally located in the bore.

Claim 1 is representative of claims 4 and 7 and reads:

> 1. A seal for insertion in a cylindrical bore in a housing about a relatively movable centrally located shaft, comprising an annular bore-engaging mounting portion of resiliently deformable material for endwise insertion in and statically sealed engagement with the bore in the housing, an annular shaft-engaging portion connected with said bore-engaging portion for running engagement with the shaft, and a *metal ring* located adjacent one end of said bore-engaging portion, said ring being *provided with a plurality of axially extending outwardly biased spring fingers in outwardly clamped engagement with said bore-engaging portion* inwardly of the outer periphery of the latter, and said ring being *also provided* outwardly of said bore-engaging portion *with means for detachably connecting the ring to the housing* outwardly of the bore in the latter. (Emphasis ours.)

Claim 10 differs from the other claims on appeal and reads:

> 10. A seal for insertion in a cylindrical bore in a housing about a relatively movable centrally located shaft, comprising a sealing ring having an outer bore-engaging portion of resiliently deformable material, which portion is of somewhat larger diameter than the bore in the housing, for press-fit insertion in the bore, and a *metal retaining ring* associated with the sealing ring, said retaining ring being connected with the sealing ring and being provided outwardly of the latter *with resiliently yieldable hook formations which are adapted to be sprung into interlocking engagement with a complementary formation associated with the housing outwardly* of the bore, which engagement acts to prevent axial displacement of the sealing ring relative to the bore in the housing. (Emphasis ours.)

The references in the case are:

> Roth, 1,546,942, July 21, 1925.
> Norton, 1,951,034, Mar. 1, 1934.
> Jepson, 2,544,324, Mar. 6, 1951.
> Chinnery et al. (British), 578,526, July 2, 1946.

Appellant's shaft seal comprises an annular sealing member of resilient deformable material which is adapted to be inserted into a cylindrical bore surrounding a relatively movable shaft. The inner portion of the sealing member is provided with a flexible lip which is held in engagement with the shaft by a garter spring. In the outer

portion of the sealing member, an annular slot is provided which is concentric with and spaced from the outer periphery of the sealing member. This slot extends axially from the end of the member and provides a pocket in which the axially extending outwardly biased spring fingers of a metallic attaching ring are located. This construction permits the spring fingers to exert a force on the resilient material in the direction of the annular wall of the bore to provide and maintain a snug engagement between the outer surface of the resilient member and the inner surface of the bore. The metallic attaching ring is also provided with radially extending resilient hooks located outwardly of the bore engaging portion of the resilient member. The housing is provided with a complementary formation outwardly of the bore which is engaged by the resilient hooks to provide a snap-on connection between the bore and the seal.

The Roth and Norton patents were relied upon by the examiner in rejecting claim 10, and since both references were considered by the board, we have included them in our consideration of this case. Roth shows a gasket structure for steam train line hose couplings. Norton shows an adjustable repair clamp for bell and spigot joints in which there is provided a sheet metal bridge piece "preferably of spring material." The bridge piece is sprung into interlocking engagement with a structural portion of the clamp and exerts its force on a resilient packing ring which, if desired, may be cemented to it.

The Chinnery et al. patent is the reference principally relied upon by the Patent Office. It shows a housing provided with a bore surrounding a centrally located shaft. A reinforced and "stiffened" sealing member formed of a material such as rubber, is press fitted into the space between the bore and the shaft. The sealing member has an inner lip held in contact with the shaft by a garter spring. The bore engaging portion of the sealing member is "stiffened" by an axially extending cylindrical sheet metal casing which acts as a reinforcing member for a definite purpose which is described by Chinnery et al. as follows:

> Owing to the limited radial space within which the oil seal is to be accommodated, the holding portion of the oil seal cannot be stiffened by being massive. Consequently the holding portion of the present oil seal is stiffened in the known manner by a reinforcement, which may either encase or line, or alternatively constitute, such holding portion and therefore makes the press-fitting contact with the machine part stationary relatively thereto, *or may be an internal reinforcement in the sense that it does not make press-*

> fitting contact with the machine part stationary relatively thereto. (Emphasis ours.)

In Fig. 8 Chinnery et al. shows a radially extending flange at the outer edge of a reinforcing member of the internal reinforcement type which flange extends beyond the sealing member "to such an extent as to serve as a means of attachment of the oil seal to the housing *i,* additional to the interference press fit of the holding portion *a* in the housing recess *g.* " The aforesaid flange is shown attached to the housing by screws or bolts.

The Jepson patent relates to a gasket for sealing the space between the upper and lower vessels of a vacuum-type coffee maker. The gasket is an annular rubber member attached to the lower part of the upper vessel and is designed to fit into the upper part of the lower one. Located in a groove in the gasket is a sleeve member provided with axially and downwardly extending spring fingers which are so biased radially as to urge the lower peripheral portion of the gasket outwardly, thus effecting a tight engagement with the mouth of the lower vessel.

Claims 1, 4, and 7 stand rejected on Chinnery et al. in view of Jepson, on the ground that it would not require "invention" to replace the cylindrical sheet metal reinforcing member, which is secured to the Chinnery et al. sealing member, by an annular set of outwardly biased spring fingers shown by Jepson.

The problems which were solved by appellant's invention existed in this art at the time of his invention despite the Chinnery et al. disclosures. It was appellant rather than Chinnery et al. who provided the art with a shaft seal in which the resilient element of the seal could be readily inserted into a bore in the housing so that it could be

removed from the bore and replaced by a new sealing element without mutilation of the sealing surface of the bore. This is particularly important, the specification points out, where the bore is formed in light metal alloys such as are used in aircraft engines and which are relatively soft and easily damaged. In appellant's oil seal, the resilient seal is so constructed that when mounted in the bore, it will establish and maintain a fluid tight relationship between the outer peripheral surface of the resilient seal member and the inside of the bore. Where either natural or synthetic rubber is used as the resilient sealing member in such seals, the rubber in time will take a set or lose its resiliency at least to the extent that the seals soon become ineffective to prevent leakage of oil. When subjected to mechanical pressures and heat, such a rubber sealing element loses its sealing effectiveness at an accelerated rate. The problems in the oil sealing art arising from such use of resilient sealing elements appear to have persisted because of the failure of the art to recognize these characteristics of the rubber sealing element and to so design the resilient element and the mounting therefor as to assure holding the outer circumference of the resilient sealing element in static oil-sealing contact with the inner circumference of the bore in which it is inserted.

Appellant's seal differs from the art of record in at least three respects:

(1) The provision of the annular slot which extends axially inward from one end of the resilient sealing element. This feature is claimed as part of the combination set forth in claim 4.

(2) The outwardly biased resilient spring means or fingers inserted in the resilient sealing element. These means are claimed as part of the combination of claims 1, 4 and 7.

(3) The "snap-on" connector which holds the resilient sealing element and engages with a complementary formation associated with the housing outwardly of the bore. This feature is in the combination of claim 10.

The patents cited by the examiner, either alone or in combination, do not disclose a resilient shaft sealing element having these features.

[1] It is common knowledge that resilient deformable materials such as either natural or synthetic rubber are incompressible, that is, while they may be deformed, this can occur only if the design and mounting of the part permits the resilient material to change its shape in response to the applied forces.

The seal construction disclosed in Chinnery et al. is such that the "interference press fit" which that patent calls for is alone relied on to keep the seal tight. There is nothing in the Chinnery et al. patent to show how the resilient sealing element is *maintained* in resilient contact with the bore otherwise than by the resiliency of the rubber. If and when that resiliency is lost, the sealing effect will be impaired.

Considering the incompressible nature of the rubber in the sealing element disclosed in Chinnery et al., its stiffening and reinforcement by the cylindrical sheet metal member, and its "interference press fit" in the bore, it seems clear to us that the Chinnery et al. seal cannot function in the manner of appellant's seal. Now, as to the contention that Jepson would suggest inserting a set of spring fingers, the resilient element of Chinnery et al. is forced so tightly into the bore

and is so "stiffened" that the use of the resilient spring fingers of Jepson could not possibly increase the resilient deformation of the Chinnery et al. seal in the direction of the bore or increase the sealing engagement of the seal with the bore. The teaching of the Chinnery et al. patent points away from the addition of any spring element. On the other hand, we find nothing in the disclosure of Jepson's coffee maker gasket to suggest that any part of it has applicability to shaft seals. The two arts are at least somewhat remote from each other even if they both involve sealing.

[2] We, therefore, find that Chinnery et al. did not teach the shaft sealing art how to solve the problems which existed in that art at the time of appellant's invention. We hold, further, that the combination of Jepson with Chinnery et al. is not a proper ground for rejection of the claims here on appeal. This suggested combination of

references would require a substantial reconstruction and redesign of the elements shown in Chinnery et al. as well as a change in the basic principles under which the Chinnery et al. construction was designed to operate.

Once appellant had taught how this could be done, the redesign may, by hindsight, seem to be obvious to one having ordinary skills in the shaft sealing art. However, when viewed as of the time appellant's invention was made, and without the benefit of appellant's disclosure, we find nothing in the art of record which suggests appellant's novel oil seal as defined in claims 1, 4 and 7.

We shall now consider the rejection of claim 10, remarking first that it differs from claims 1, 4 and 7 in that it is directed to a combination of a housing bore, a resilient sealing ring and a metal retaining ring connected to the sealing ring, wherein the metal ring has *resilient hooks* which secure the seal in the bore. This claim is not limited to the outwardly biased spring fingers.

The examiner rejected claim 10 on two grounds: (1) that substitution for the screw securing means of Chinnery et al. of a series of spring hooks such as disclosed by Norton would not involve patentable invention, and (2) unpatentability over Roth.

[3] We shall first dispose of the second rejection. The board held that claim 10 is drawn to a combination of a sealing ring and a housing bore in which the sealing ring is detachably placed and that Roth discloses nothing of this nature. The board therefore reversed the rejection on Roth and consequently it is not before us.

As to the first rejection, the board recognized that it was on the ground of unpatentability "over Chinnery et al. in view of Norton" and pointed out that the examiner could see nothing patentable in substituting spring hook attaching means shown in Norton for the screws of Chinnery et al. It then said:

> Appellant argues that the references fail to suggest or teach how the proposed [claimed] combination could be made and after a careful consideration of the references, *we have concluded that he is correct in this respect. We therefore concede that the claim * * * defines novelty over the disclosure of Fig. 8 of Chinnery et al.* Novelty alone however, is no proper basis for the allowance of a claim. (Emphasis ours.)

[4] Although, in reaching this conclusion, the board made no reference to Norton, the context compels the conclusion that novelty was found notwithstanding the disclosure of Norton, taken together with Chinnery et al. We fully agree, of course, with the board's statement that novelty alone is not enough for patentability.

With the next statement of the board, in explanation of its affirmance of the rejection of claim 10, we do not agree. It reads:

> In order to *properly* define invention [meaning, of course, *patentable* invention], a claim should clearly define a structure *which possesses some definite advantage over the prior art.* As far as we can determine there is *no better* combination of housing and seal produced by using a series of snap fastener connections to connect the seal to the housing, as in appellant's structure, over using a series of bolts, as in the structure shown by Chinnery et al. Both act to merely detachably connect one element to another element and as far as we can find are merely equivalent connecting means especially in the absence of any unexpected result *or advantage* being obtained, by using one means in preference to the other, on which the record before us is entirely silent. (Emphasis ours.)

If we may extract from the foregoing what we understand to be the essence of the board's position in the matter, it is that claim 10 is not patentable, though it defines a combination which is novel over the disclosures of the references, because the claimed combination has not been shown to be any better than, or to possess any advantage over, what was known to the art.

[5][6] As was pointed out in In re Stempel, Jr., 44 CCPA 820, 241 F.2d 755, 113 USPQ 77 , an applicant is entitled to a patent, under the statutes, unless one of the prohibitory provisions of the statutes applies. The statutory requirements

for patentability, broadly stated, are novelty, usefulness and unobviousness, as provided in 35 U.S.C. sections 101, 102, and 103. While it is true that proof that an invention *is* better or *does* possess advantages may be persuasive of the existence of any one or all of the foregoing three requirements, and hence be indicative of patentability, Congress has not seen fit to make such proof a prerequisite to patentability. [1]

[7]Appellant's invention, as defined in claim 10, has been held by the board to possess novelty over the disclosure of Chinnery et al. Just what the board thought about the pertinency of Norton is obscure but it seems to have regarded this reference as of little moment. Appellent in his brief here said that Norton was held by the board to have no bearing on the invention and the Patent Office brief said that the appellant was correct in so stating and that the court need not consider it. We are, therefore, virtually without any reference against claim 10 except Chinnery et al. and the rejection thereon is predicated solely on a theory of patentability we find to be outside of the patent statutes, namely, that the combination of claim 10 is, by reason of the use of spring retaining hooks instead of a series of bolts, *no better* than the combination of Chinnery et al. However intriguing such a ground of rejection may be, it is the duty of the tribunals of the Patent Office and of this court to apply the law as Congress has written it. While the provisions of the formerR.S. 4893 may be said to have given the Commissioner some discretion in refusing to grant a patent on an otherwise patentable invention unless "the same is sufficiently useful and important," when the Patent Codification Act of 1952 was enacted, Congress removed this provision from old section 36 of title 35, now section 131. We take this as a further indication that it is the intent of Congress that patentability be determined solely by the provisions of sections 101, 102 and 103. We therefore reverse the board on this ground of rejection of claim 10.

If the issue before us were whether or not the spring hooks *are* better than the Chinnery et al. bolts—and we consider this in the event we have misapprehended the position of the board—we would hold that they are, on the basis of what is disclosed in the application. This retaining means seems to possess many advantages over screws. Similarly, if the board was intending to say that the hooks and the bolts are merely equivalent connecting means and that claim 10 is unpatentable because its combination differs from the prior art only in the substitution of an equivalent for one element in an old combination, then we would also have to disagree since we think it is clear that the use of the spring hooks produces a result quite different from the bolts of Chinnery et al. On the record before us no reference relied on shows any spring hooks nor does it contain any support for the contention that bolts and spring hooks are equivalents.

For the foregoing reasons we reverse the rejection of claim 10.

The rejections of claims 1, 4, 7 and 10 are *reversed.*

Footnotes

Footnote 1. A critical essay on the existing law has recently appeared under the title "A Proposal for: A Standard of Patentability; Consonant Statutory Changes; A Manual on Determination of Patentability," by Malcolm F. Bailey, 41 J.P.O.S. 192-225, 231-257. It advocates, as we understand it, that the present law should be changed to set up as the test for patentability, in place of the requirement of section 103 that an invention be unobvious, a requirement that the invention involve *progress,* which the author finds in the constitutional provisions. Congress has not seen fit to include in the statutes, at any time during the past 169 years so far as we are aware, a requirement that each and every patentable *invention* shall involve "progress" in this sense, i.e., that each new invention must also be shown to possess some definite advantage over the prior art. The author relates the term "progress" to individual inventions and then gives it the connotation that each such invention should be a technical advance, improvement or betterment. The very making of the suggestion to change the law is an indication that the existing law is otherwise.

Concurring Opinion Text

Concur By:

MARTIN, Judge, concurs in result.

Dissenting Opinion Text

Dissent By:

KIRKPATRICK, Judge, dissenting, in which WORLEY, Chief Judge, joins.

I think that the board's rejection of claims 1, 4 and 7 should be affirmed. The central idea and the most important feature of these three claims, as well as of allowed claim 5, is the exertion of outwardly directed pressure upon the bore engaging portion of the sealing member, the result accomplished being to counteract the tendency of rubber to "set" or lose its resiliency and so become ineffective to prevent leakage. Jepson comes very close to completely anticipating this feature of the patent. All that would be necessary to make the anticipation complete would be to provide the Jepson seal with a shaft engaging portion and, incidentally, claim 7 does not specify any shaft engaging portion.

Of course, it was necessary that the seal be attached to the bore in a manner to prevent its displacement. Chinnery provides a flange and screws for this purpose and none of the three claims referred to calls for anything more specific than "means." Thus it seems clear that

claims 1, 4 and 7 show no patentable novelty as against the prior art of Chinnery plus Jepson.

The only question is whether Jepson is in a nonanalogous art sufficiently remote from that of the application to put it beyond the probability that it would be considered by persons skilled in the art endeavoring to solve the problem to the solution of which the application is directed. I do not think that it is. Jepson was trying to meet exactly the same problem as the application under consideration, namely, to provide a compressible seal which could be readily detached or inserted in a cylindrical bore but which would maintain a firm and leakproof seat on the bore when in place. I agree with the Solicitor's argument that one seeking to improve a machinery seal would reasonably be expected to investigate not only machinery seals but seals in other arts where similar problems would be encountered. See In re O'Connor, 34 CCPA 1055, 161 F.2d 221, 73 USPQ 433 .

Claim 10 stands on a somewhat different basis. This claim entirely omits what I think, and have stated above, to be the heart of the application. In substance, claim 10 really amounts to no more than a claim for a hook formation to interlock with the housing of a bore in order to hold a press fit seal in place. [1] Chinnery discloses means to serve the same purpose consisting of screws.

The board conceded that the combination disclosed in claim 10, consisting of spring hooks to fasten a press fit seal to the bore, disclosed novelty over Chinnery but not patentable novelty.

I do not read the opinion of the board as predicating its conclusion of want of invention on the theory that in order to be patentable a combination must have some distinct advantage over the prior art. The board stated that there was nothing in the record to show that the substitution of hooks for screws produced any unexpected result or advantage and, therefore, concluded that the introduction of hooks did not create patentable novelty, but was a mere substitution of equivalents. The statement that the spring hooks of Ratti were no better than the screws of Chinnery was directed toward this point and seemingly was added to fortify the board's finding of equivalency rather than to propound a theory of patentability. I agree with the board that this claim, though it may show novelty over Chinnery, does not show patentable novelty, and I would affirm its rejection.

Footnotes

Footnote 1. Chinnery discloses a press fit seal, but no one has suggested that there is anything new about such a device and the specification of the application before us concedes that it is old in the art.

Footnote * United States Senior District Judge for the Eastern District of Pennsylvania, designated to participate in place of Judge O'CONNELL, pursuant to the provisions of Title 28, United States Code, Section 294(d).

- End of Case -

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FULL TEXT OF CASES (USPQ2D)
All Other Cases

Smithkline Diagnostics Inc. v. Helena Laboratories Corp. (CA FC) 8 USPQ2d 1468 Smithkline Diagnostics Inc. v. Helena Laboratories Corp.

U.S. Court of Appeals Federal Circuit
8 USPQ2d 1468

Decided October 12, 1988
Nos. 87-1532 and -1533

Headnotes

PATENTS

1. Patent construction -- Claims -- Defining terms (§ 125.1305)

Claim limitation, for specimen test slide and method for detecting occult blood in fecal matter, specifying that catalyst of positive monitor is "a compound that reacts to environmental conditions in a manner similar to hemoglobin," must be read to include hemoglobin itself.

2. Patentability/Validity -- Obviousness -- In general (§ 115.0901)

JUDICIAL PRACTICE AND PROCEDURE

Procedure -- Judicial review -- Standard of review -- Patents (§ 410.4607.09)

Appellate review of federal district court's factual findings underlying its conclusion on obviousness is governed

by clearly erroneous standard, although conclusion of obviousness or non-obviousness is reviewed as matter of law.

PATENTS

3. Patentability/Validity -- Obviousness -- Relevant prior art (§ 115.0903)

Patent infringement defendant which alleges invalidity due to obviousness cannot pick and choose among individual elements of assorted prior art references to recreate claimed invention, but rather must show some teaching or suggestion in references to support their use in particular claimed combination.

4. Patentability/Validity -- Inventorship (§ 115.13)

35 USC 116, as amended in 1984, which authorizes joint inventorship even if named inventors did not jointly invent every claim, applies to patent even though patent was in litigation on date of statute's enactment and even though 35 USC 106(e) specifies that parties in cases pending on date of enactment shall have their rights determined on basis of "substantive law" in effect prior to date of enactment, since "all claims" rule, which requires inventorship entity to be true origin of every claim in patent, was not uniformly accepted as "substantive law" before 1984 amendments.

5. Infringement -- Defenses -- Estoppel (§ 120.1103)

Patent infringer that marketed slides for detecting occult blood in fecal matter with non-infringing lead acetate but that failed to alter package insert stating that slides contained hemoglobin, which is infringing, is not estopped from denying that slides contained hemoglobin, and thus cannot be said to have committed "infringement by estoppel," since admittedly non-infringing product cannot be converted by estoppel into infringing product.

6. Patentability/Validity -- Fraud or inequitable conduct (§ 115.15)

Lack of any evidence of patentee's actual wrongful intent or gross negligence precludes finding of inequitable conduct, since such evidence, although it need not be direct but may be inferred from patentee's conduct, is required for finding of inequitable conduct.

Particular patents -- Chemical -- Specimen test slides

4,365,970, Lawrence and Townsley, specimen test slide for detecting hidden or invisible (occult) blood in feeal matter and thereby for early diagnosis of gastroentrological diseases including colorectal cancer, and method improvement of built-in verification controls, claims 1, 2, 4, and 5 valid, infringed as to defendant's product containing hemoglobin but not infringed as to defendant's product containing lead acetate.

Case History and Disposition:

Page 1469

Appeal from the U.S. District Court for the Eastern District of Texas, Fisher, J.

Patent infringement action brought by Smithkline Diagnostics Inc. against Helena Laboratories Corp. From federal district court ruling holding patent valid but not infringed, parties cross-appeal. Affirmed in part on modified grounds, reversed in part, and remanded.

Attorneys:

Donald Dunner, of Finnegan, Henderson, Farabow, Garrett & Dunner, Washington, D.C. (Allen M. Sokal, Washington, D.C., on brief; Alan D. Lourie and Stuart R. Suter, Philadelphia, Pa., of counsel), for plaintiff-appellant.

Jerald I. Schneider, of Cullen, Sloman, Cantor, Grauer, Scott & Rutherford (Charles R. Rutherford, with them on brief), Detroit, Mich., for defendant/cross-appellant.

Judge:

Before Nichols, senior circuit judge, and Rich and Nies, circuit judges.

Opinion Text

Opinion By:

Nies, J.

SmithKline Diagnostics, Inc. (SKD) appeals the final judgment of the United States District Court for the Eastern District of Texas, *SmithKline Diagnostics, Inc. v. Helena Laboratories Corp* ., 662 F.Supp. 622 (E.D. Tex. 1987), holding United States Patent No. 4,365,970 ('970) valid as between the parties but not infringed by either of two accused products of Helena Laboratories Corp. Based on its holding of noninfringement, the court dismissed SKD's complaint. SKD appeals the findings of noninfringement. In a cross appeal, Helena asserts that if the judgment of noninfringement is not affirmed, this court should re

Page 1470

verse the judgment that the asserted claims are not invalid for obviousness. Helena also asserts error in that the court did not uphold other pleaded defenses or its counterclaim for unfair competition, matters on which the court made no explicit findings or conclusions.

We affirm the judgment of validity, but on different grounds from those stated by the district court. On the issue of infringement, we affirm the finding that Helena's product containing lead acetate does not infringe the asserted

claims but reverse with respect to Helena's product containing hemoglobin. Helena has failed to persuade us that the record shows triable issues on the other matters raised in its cross appeal. Thus, we affirm-in-part on modified grounds, reverse-in-part, and remand for calculation of damages.

I

BACKGROUND

SKD owns the '970 patent, issued to two of its employees, Dr. Paul Lawrence and Charles Townsley, on December 28, 1982. The patent covers a specimen test slide and method for detecting occult (hidden or invisible) blood in fecal matter, an early symptom of a variety of gastroenterological diseases including colorectal cancer. More specifically, the test slide contains a piece of paper impregnated with a colorless compound, guaiac, which turns blue in the presence of a developing solution, such as hydrogen peroxide, and a catalyst, such as hemoglobin in the blood. Thus, a blue color indicates blood is present, a "positive" result; the absence of blue, a "negative" result, indicates the absence of blood. In practice, a patient places fecal samples on each of several designated test areas on the slide and returns the slide to his physician or a laboratory for testing. To test, a developing solution is place on the test areas, and the areas are observed for color. This much of the subject invention is in the prior art. *See* United States Patent No. 3,996,006 (issued to Pagano on Dec. 7, 1976).

It is important to verify that the guaiac paper and developing solution are working properly. If either the paper or solution has lost effectiveness, a false negative result may occur, failing to detect the presence of existent cancer. Conversely, if the paper or solution becomes contaminated, a false positive test may occur, causing patient anxiety and unnecessary clinical investigations. To ensure accuracy, separate materials (external controls) were sold which could be used to check that the paper and solution were actually working. The parties dispute whether external controls consisted only of a representative unused slide from a batch of slides or also included a slide having three test areas with only one area being used for the fecal smear, the others for testing performance of the product. There is no dispute, however, that in either case the control was not built into the slide.

The invention of the '970 patent improves on the Pagano test slide and separate verification controls by providing built-in positive and negative monitors separate from the test areas. The positive monitor contains (i.e., is printed with) a catalyst, which must be a compound that reacts to environmental conditions in a manner similar to hemoglobin. The negative monitor lacks the catalyst; thus, it consists of the guaiac-laden paper alone. In practice, developing solution is added to the two monitors after it is applied to the fecal test areas. A blue color on the positive monitor indicates that the paper and solution are working. The absence of blue on the negative monitor assures that the slide has avoided contamination.

SKD asserts that independent device claim 1, claims 2 and 4 which depend from claim 1, and independent method claim 5 of the '970 patent are infringed. 1 Claims 1 and

5, the only independent claims asserted, both contain the limitation that the catalyst of the positive monitor is "a compound that reacts to environmental conditions in a manner similar to hemoglobin." Whether that claim limitation, as properly interpreted, excludes hemoglobin itself is critical, as we shall see, to the issues of validity and infringement.

When the '970 patent issued in December of 1982, SKD was marketing a slide, under the trademark HEMOCCULT, which contained hemin as the catalyst. At that time, Helena had competitive slide products on the market, sold under its COLOSCREEN mark, which used hemoglobin as the catalyst in a positive test monitor. Later, in April of 1984, Helena changed to use of lead acetate rather than hemoglobin as the positive monitor's catalyst. Until November 1985, however, Helena continued to enclose literature in its slide packages stating that the positive monitor contained hemoglobin.

SKD asserted infringement of the '970 claims, both literally and under the doctrine of equivalents, by the Helena products containing hemoglobin. With respect to Helena's lead acetate product, SKD asserted that Helena should be estopped to deny that its product contains hemoglobin because it continued to indicate that the product contains hemoglobin after the change was made to lead acetate. SKD did not assert that the lead acetate product would be covered by the claims but for the misrepresentation.

Helena contended that its products containing hemoglobin do not infringe because the claim language "similar to hemoglobin" literally excludes hemoglobin itself, and that the prosecution history precludes interpreting the claim to cover a hemoglobin product. Helena also asserted that the '970 claims in issue are invalid as obvious within the meaning of 35 U.S.C. §103 (1982), and invalid under 35 U.S.C. §116 (1982) for failure to name the proper inventors. In addition, Helena asserted the defense of inequitable conduct and raised an unfair competition counterclaim.

The district court interpreted the claim limitation at issue as excluding hemoglobin itself. Based upon that interpretation, the court found the invention of the '970 patent nonobvious. Had the claims covered hemoglobin, however, the court stated that the claim would have been invalid as obvious over prior art disclosing hemoglobin as a catalyst in positive test monitors.

Under its interpretation of the claim limitation "similar to hemoglobin" recited in claims 1 and 5, the court found Helena's hemoglobin-containing slides noninfringing, either literally or under the doctrine of equivalents. It rejected SKD's estoppel argument with respect to Helena's products containing lead acetate. It further held that, if Helena were found to infringe, the infringement was not willful, an issue not appealed.

Neither in its judgment nor in its findings of fact and conclusions of law did the district court mention Helena's other defenses or its counterclaim for unfair competition. Both parties have appealed, each asserting error in certain findings and conclusions made adverse to them, and each raising various arguments concerning issues not explicitly ruled on by the court.

II

OPINION

A. *Claim Interpretation*

The claims of the '970 patent measure the invention at issue; thus, the claims must be interpreted and given the same meaning for purposes of both validity and infringement analyses. *See, e.g., SRI Int'l v. Matsushita Elec. Corp. of Am* ., 775 F.2d 1107, 1121, 227 USPQ 577, 585 (Fed. Cir. 1985) (in banc). To ascertain the meaning of the claims, we look to the claim language, the specification, and the prosecution history. *ZMI Corp. v. Cardiac Resuscitator Corp* ., 844 F.2d 1576, 1579, 6 USPQ2d 1557, 1560 (Fed. Cir. 1988); *Loctite Corp. v. Ultraseal Ltd* ., 781 F.2d 861, 867, 228 USPQ 90, 93 (Fed. Cir. 1985). Also relevant are the other claims and expert testimony. *See, e.g., Perini America, Inc. v. Paper Converting Mach. Co* ., 832 F.2d 581, 584, 4 USPQ2d 1621, 1624 (Fed. Cir. 1987). Moreover, the claims should be construed as one skilled in the art would construe them. *Specialty Composites v. Cabot Corp* ., 845 F.2d 981, 986, 6 USPQ2d 1601, 1604 (Fed. Cir. 1988).

This court reviews a district court's claim interpretation as a matter of law, unbridled by the constraints of the "clearly erroneous" standard of review. That interpretation may

depend, as here, however, on evidentiary material which requires resolution of factual issues, such as what occurred during the prosecution history. *See, e.g., ZMI Corp* ., 844 F.2d at 1578, 6 USPQ2d at 1559; *Uniroyal, Inc. v. Rudkin-Wiley Corp* ., 837 F.2d 1044, 1054, 5 USPQ2d 1434, 1441 (Fed. Cir. 1988); *Tandon Corp. v. United States Int'l Trade Comm'n* , 831 F.2d 1017, 1021, 4 USPQ2d 1283, 1286 (Fed. Cir. 1987). We review

resolution of those factual issues under the clearly erroneous standard. *See, e.g., Perini America* , 832 F.2d at 584, 4 USPQ2d at 1624.

The dispute in this case centers on the meaning of the claim limitation "including a compound that reacts to environmental conditions in a manner similar to hemoglobin," which appears in independent claims 1 and 5 and is, of course, a limitation in dependent claims 2 and 4. Helena argues, and the district court concluded, that the phrase must be interpreted to exclude hemoglobin itself. On the other hand, SKD contends that the phrase encompasses hemoglobin as well as other similar materials. We turn to the sources useful in claim interpretation to resolve this dispute.

1. *The Claim Language*

The first requirement in claim interpretation is to examine the claim language. *ZMI Corp* ., 844 F.2d at 1579, 6 USPQ2d at 1560; *McGill, Inc. v. John Zink Co* ., 736 F.2d 666, 672, 221 USPQ 944, 948 (Fed. Cir.), *cert. denied* , 469 U.S. 1037 (1984). Helena argues that the "ordinary" meaning of "similar to" excludes "identical." Although that argument has a superficial logic, we cannot agree, in the context of these claims, that the phrase "similar to hemoglobin" necessarily excludes hemoglobin.

In finding that the claims exclude hemoglobin, the district court relied upon the statement of one co-inventor, Dr. Lawrence. In a report on his work, Dr. Lawrence had written that "the stabilities of the proteins [such as hemoglobin] are too short to be compatible with standard dating of HEMOCCULT slides." 2 The district court took that statement to indicate Dr. Lawrence's belief that hemoglobin would not work. 662 F.Supp. at 628.

Taken in context, however, Dr. Lawrence's statement does not indicate that he believed hemoglobin would not work at all, as shown in the following additional excerpts from the report:

A variety of catalysts may be printed: for example, . . . Fe/protopurphyrin (hemin); homo proteins such as hemoglobin (Hb) . . . may be similarly used.

Printing of proteins such as Hb . . . presents practical difficulties. High concentrations are required . . . . More important, once printed the stabilities of the proteins are too short to be compatible with standard [three year] dating of Hemoccult(R) slides. . . .

. . . .

emin spots have a dated stability comparable or greater than Hemoccult(R) slides.

Nowhere does Dr. Lawrence state that hemoglobin *cannot* be used. The thrust of his analysis is a justification for his preference for hemin over other alternatives, inasmuch as it had sufficient stability to meet the standard three-year dating period. In fact, Dr. Lawrence states that hemin and hemoglobin "may be similarly used." Moreover, he testified at trial that hemoglobin would work and that methods were known for stabilizing hemoglobin, one of the problems he noted as a reason why hemin works better. In any event, the claim does not contain a limitation with respect to the duration of the catalyst's effectiveness.

We cannot conclude that the claim language indicates what characteristics the catalyst must have. The limitation at issue does not identify specific catalysts to be included or excluded. Viewed in this manner, the limitation does not exclude hemoglobin; rather, it reflects the fact that a compound similar to hemoglobin may work better than hemoglobin itself.

2. *Specification*

The limitation need not be given a more restrictive meaning in the claims of the '970 patent by reason of the specification. The specification of the '970 patent shows a clear intent by the inventors to include hemoglobin when they claimed their invention. It states:

Since guaiac-based fecal occult blood tests are actually testing for the catalytic activity of hemoglobin in blood, the *positive monitor should employ either hemoglobin or a catalyst which would react to adverse environmental conditions in a manner similar to hemoglobin. Preferably* , the test slide of this invention employs *hemin* , a hemoglobin derived catalyst, as the catalyst in the positive monitor.

'970 Patent Specification, col. 4, ln. 1-8 (issued Dec. 28, 1982) (emphasis added).

Thus, the specification specifically discloses hemoglobin and hemin, with the latter preferred, as compounds to be used in the positive monitor. We agree with SKD that it would be a strained interpretation to exclude hemoglobin from the claims when the specification specifically discloses it as a viable candidate for the positive monitor catalyst.

Helena offers a convoluted argument to overcome the specification's disclosure of hemoglobin as a catalyst. The argument begins with the premise that the '970 patent described two functions for the monitor: testing both for proper functioning of the chemicals (guaiac and developer) and for deterioration of the fecal sample caused by the environment. (Other suppliers' slides test only the former and use hemoglobin). Thus, Helena asserts, the patent requires a control that deteriorates in the same way as the blood deteriorates in the fecal sample. Hemoglobin does not deteriorate like blood (note the instability problem Dr. Lawrence related), hence, Helena reasons, the patent claims cannot include hemoglobin. Per Helena, the specification suggests instead that hemin will perform both functions in the positive monitor, as will a compound that "reacts to environmental conditions in a manner similar to hemoglobin" in the blood of the fecal sample.

Helena's argument fails for a number of reasons. Most basic is the fact that neither the claims nor the specification require the positive monitor catalyst to deteriorate like blood in a fecal sample. In addition, the argument ignores entirely the specific disclosure in the specification that hemoglobin is a suitable compound for use as the catalyst. Finally, Helena offers no evidence to show that hemin, which it argues is encompassed by the claims, is relatively more like blood in the fecal samples in terms of deterioration than is hemoglobin.

3. *Prosecution History*

The prosecution history is still another tool useful for claim interpretation. *See, e.g., ZMI Corp* ., 844 F.2d at 1580, 6 USPQ2d at 1561; *McGill Inc* ., 736 F.2d at 673, 221 USPQ at 949. The district court relied most heavily on that tool and determined that, through a claim amendment, the inventors had narrowed the claims to exclude hemoglobin.

The claim limitation at issue was not present in the original claims as filed with the United States Patent and Trademark Office (PTO). Instead, claim 1 provided "the improvement comprising: a control area having a positive and a negative monitor said control area positioned on a portion of the sheet." The Examiner rejected the claims as obvious under 35 U.S.C. §103 (1982), citing United States patents to Pagano (3,996,006) and Friend (4,175,923). Friend discloses a "throw-in-the-bowl" type of test product made of paper impregnated with guaiac. A section of the paper also has impregnated a blood component (forming a built-in positive monitor). The user sprays the entire paper sheet with developer and first observes it to confirm that the guaiac chemical is working properly. Proper functioning is assured if the part of the paper impregnated with blood component turns blue. The user then drops the product into a toilet bowl containing fecal matter, where the remainder of the paper will turn blue if the fecal matter contains blood or will remain white, indicating the absence of blood.

The Examiner maintained that it would have been obvious from the teaching of Friend to provide positive and negative monitors on the Pagano slide. In response to the First Office Action, on January 25, 1982, the inventors argued that "Friend fails to disclose any negative monitor or control." Thereafter, the Examiner issued a Final Action rejecting the claims as obvious: "Even though Friend is concerned with positive control, it would be obvious to the routineer that both positive and negative controls could be incorporated in Pagano."

The Examiner granted the inventors an interview on July 8, 1982, which the Examiner summarized as discussing the arguments "that areas are not only control but monitors of performance for both false positives and negatives" and "that prior art does not show a negative monitor that indicates false positives." The inventors described the interview, in an Amendment After Final Rejection filed on July 20, 1982, as emphasizing "that Friend fails to

disclose any negative monitor or control. . . . The criticality of having a negative monitor present on the occult blood slide was thoroughly discussed at the interview." At this point in the prosecution, neither the Examiner nor the inventors had mentioned the limitation now at issue.
Those parties then conducted a telephone interview on July 27, 1982. In his Summary Record of the conversation, the Examiner states:
Agreed to amendment of the claims as per Examiner's Amendment (Paper No. 9) to particularly recite the positive and negative monitors.
Paper No. 9 contained the amendment introducing the "similar to hemoglobin" limitation at issue. Following that amendment, the

'970 patent claims were allowed on August 6, 1982.
The district court concluded that the Examiner allowed the patent claims only because of the amendment to overcome the disclosure in the Friend patent. Finding that Friend discloses use of hemoglobin as the positive catalyst, the court determined that the amendment narrowed the claims to avoid that disclosure by excluding hemoglobin from the '970 claims.
Where the district court clearly erred is in its last finding, that the amendment was made to overcome the disclosed use of *hemoglobin* in a monitor. Friend does not specifically disclose or claim a hemoglobin catalyst. Rather, Friend claims "blood" as a substrate or composition for the positive monitor catalyst. Friend's patent specification discloses "commercially available dried human or animal blood" and "components of blood" as the positive catalyst. Consequently, Friend's teaching, although it includes hemoglobin as the catalyst, was not so restricted and an amendment excluding hemoglobin but including hemin (another blood component) would not have overcome Friend's broad disclosure of blood component catalysts.
Thus, we are unpersuaded that the amendment to claim subject matter "similar to" hemoglobin was made to overcome Friend's disclosure of a hemoglobin catalyst. The purpose of the amendment is unclear. SKD reads the Examiner's statement that the amendment was made "to particularly recite the positive and negative monitors" literally and contends that the amendment was made only to satisfy the definiteness requirement of 35 U.S.C. §112 (1982) ("The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention."), and not to avoid an obviousness rejection based upon the prior art. We need not determine the purpose for the amendment. We merely hold that the district court's finding, that the amendment was made to overcome Friend's disclosure of a hemoglobin catalyst, is clearly erroneous.

4. *Conclusion*

[1] The district court's findings that the inventor believed hemoglobin would not work and that the claims were amended to exclude hemoglobin disclosed as a catalyst in the prior art are clearly erroneous. We conclude, as a matter of law, that the asserted claims of the '970 patent, properly interpreted, include hemoglobin itself, as well as compounds that react to environmental conditions in a manner similar to hemoglobin, as a positive monitor catalyst.
Because we have determined that the district court improperly interpreted the claims, the remainder of its decisional process on the issues of validity and infringement is distorted. *See, e.g. Panduit Corp .*, 810 F.2d 1561, 1576, 1 USPQ2d 1593, 1603 (Fed. Cir.) ("When the prior art is compared with erroneously interpreted claims, findings of differences between the prior art and the claims will necessarily be clearly erroneous."), *cert. denied* , 107 S.Ct. 2187 (1987); *Moeller v. Ionetics, Inc .*, 794 F.2d 653, 656, 229 USPQ 992, 994 (Fed. Cir. 1986) (improper claim construction can distort entire infringement analysis). Keeping this in mind, we now turn to those issues.

B. *Validity*

1. *Obviousness*

a. *The Standard*

[2] Helena challenges validity of the '970 patent on the grounds that the claimed invention would have been obvious within the meaning of 35 U.S.C. §103 (1982). 3 In evaluating that challenge, the district court properly began its analysis with the presumption that the patent is valid. *See* 35 U.S.C. §282 (1982). That presumption places the burden of proof of facts, and the ultimate burden of persuasion to establish invalidity, on Helena. *See, e.g., Carella v. Starlight Archery & Pro Line Co* ., 804 F.2d 135, 138, 231 USPQ 644, 646 (Fed. Cir.), *amended* 1 USPQ2d 1209 (Fed. Cir. 1986). In reviewing the district court's factual findings underlying its conclusion, we are governed by the clearly erroneous standard. *See, e.g., Panduit Corp* ., 810 F.2d at 1566, 1 USPQ2d at 1595-96. We review the conclusion of obviousness or nonobviousness drawn from the facts so reviewed as a matter of law. *Id* . at 1569, 1 USPQ2d at 1598.

b. *The Factual Inquiries*

Although the district court upheld the validity of the claims in issue, it did so only if

the claims were interpreted to exclude hemoglobin. 662 F.Supp. at 626. Having concluded that hemoglobin is within the claims, we can affirm the judgment of validity only if the facts are undisputed or if the court made other findings which lead to that same legal conclusion of nonobviousness despite the claims' coverage of hemoglobin. 4 The latter situation occurs here. The court found that "[t]he '970 patent discloses and claims the *first* fecal occult blood specimen test *slides having built-in positive and negative monitors* for verifying the proper performance of the slide." *Id* . at 624 (emphasis added). The court also made the following findings which are pertinent to the issue of nonobviousness:

Dr. Lawrence of SKD, a coinventor of the '970 patent, followed a different approach [from that historically taken], namely a [sic] built-in positive and negative controls on each slide. This had the advantage of verifying the performance of every slide and it was much easier to use than external controls. Furthermore, a built-in positive monitor printed during manufacturing gave more reproducible results than external controls that were applied in variable amounts. Dr. Lawrence's approach was also new in that he no longer sought only controls that simulated feces. Monitors that indicated only whether the slide and developer were working properly avoided the confusion that could result from comparing the test results on the actual fecal specimen and on the monitors.

Id . at 625.

The above analysis would lead to a conclusion of nonobviousness even if hemoglobin is the catalyst. The court did not explain why hemoglobin as the positive monitor catalyst changed that analysis, and we see none. Helena maintains that the court erred in not holding the claims invalid, whether or not hemoglobin is the catalyst, because the improvement of placing monitors on a Pagano slide is obvious from the Friend teaching of a positive monitor on the throw-in-the-bowl type of occult blood testing device and method. Given the nature of the Friend product, we cannot agree that the disclosure of a control in Friend (whether positive alone or positive and negative) is a sufficient teaching to make the claimed combination obvious.

[3] Friend explicitly discloses only a positive monitor. Although never mentioned by Friend, if the portions of the paper not impregnated with blood component do not remain white when developer is applied, then product contamination would be indicated. The parties dispute whether that fact amounts to an inherent disclosure of a negative monitor. The asserted "inherent" monitor of Friend's claimed product is the test area itself, however, whereas the claims at issue require control areas which are "isolated from" the test areas on the "rear" of the slide.

Merely pointing to a negative monitor in the prior art, which constitutes Helena's main argument to establish obviousness, is unpersuasive. Helena cannot pick and choose among the individual elements of assorted prior art references to recreate the claimed invention. *See, e.g., Azko N.V. v. United States Int'l Trade Comm'n* , 808 F.2d 1471, 1481, 1 USPQ2d 1241, 1246 (Fed. Cir. 1986), *cert. denied* , 107 S.Ct. 2490 (1987). Helena has the burden to show some teaching or suggestion in the references to support their use in the particular claimed combination. *Uniroyal Inc* ., 837 F.2d at 1051, 5 USPQ2d at 1438-39. A holding that combination claims are invalid based merely upon finding similar elements in separate prior art patents would be "contrary to statute and would defeat the congressional purpose in enacting Title 35." *Panduit Corp* ., 810 F.2d at 1577, 1 USPQ2d at 1605.
Friend's suggestion begins and ends with the disclosure of a built-in control. Nothing in Friend suggests the particular structure or method of the claims, read as a whole. *Id* . (claims, entire prior art, and prior art patents must each be read "as a whole"). The claimed structure positions the monitors on each slide in such a way that the fecal material may contact the slide without contaminating the control areas. *See* '970 Patent Specification at col. 2, ln. 10-18 ("These [monitors] comprise two small areas or spots printed on an isolated area of the guaiac test paper at some distance from the portions of the test paper underlying each of the [two test areas]. In this manner the positive spot

(monitor) is of such shape and size and placed in such a positive relation to the stool sample(s) that there can be no confusion of its blue color with that of a positive stool sample."). This location provides the advantage that the fecal matter may be conveniently tested at the later time by a laboratory or physician, at which time the monitors will also be activated. *See id* . at col. 3, ln. 38-53 ("To use the slide, the patient . . . applies with an applicator a thin smear of specimen from a portion of his stool on sheet 32 through opening 30 . . . . The cover is then closed . . . . The patient returns the slide either to his physician or a laboratory. The physician or technician [adds] developing solution . . . [and] [t]he test results are then observed.").
Helena also asserts that the claim language is so broad that it would encompass prior art controls in which a blood component for monitoring purposes is not originally on the slide. On the other hand, SKD asserts that the claims require that the monitor must be built into the slide. We agree with SKD.
The specification states that:
It is still a further object of this invention to provide a simple, rapid, convenient, inexpensive and *built-in control test* which would monitor the test reagents from the date of manufacture to the date of development.
Id . at col. 2, ln. 2-6 (emphasis added). That portion of the specification supports the district court's view that "[t]he '970 patent discloses and claims the first fecal occult blood specimen test slide having built-in positive and negative monitors for verifying the proper performance of the slide." 662 F.Supp. at 624. The claims that the district court was referring to when it stated its view were claims 1 and 5, which require "an area *positioned on* a portion of *the sheet* . . . . , said area including a positive and negative monitor." (Emphasis added.) Thus, we agree with the district court's interpretation that the '970 patent claims a test slide having built-in positive and negative monitors. Accordingly, we conclude that, fairly read, the claims cover only slides in which the catalyst is built into the slide itself.
We also agree with the district court that some, but not overwhelming, support for a conclusion of nonobviousness is provided by the objective evidence. *See, e.g., W.L. Gore & Assocs., Inc. v. Garlock, Inc* ., 721 F.2d 1540, 1555, 220 USPQ 303, 314 (Fed. Cir. 1983) (Objective evidence of nonobviousness "may in a given case be entitled to more weight or less, depending on its nature and its relationship to the merits of the invention. It may be the most pertinent, probative, and revealing evidence available" on the issue.), *cert. denied* , 469 U.S. 851 (1984). 5

c. *Conclusion*

After consideration of all of Helena's arguments, we are unpersuaded that the facts established by the record lead to

the conclusion that the claims of the '970 patent are invalid under 35 U.S.C. §103. Accordingly, we affirm the district court's judgment of validity, but on different grounds from those stated by that court.

2. *Inventorship*

Helena contends that the '970 patent is invalid because it does not satisfy the requirement that the true inventor or inventors be named. 6 The springboard to that contention is Helena's interpretation of the '970 patent claims as not restricted to built-in control monitors. Using that springboard, Helena asserts that the patent claims match the work done by Lawrence's and Townsley's predecessors at SKD. We agree with the district court, however, that the claims are restricted to built-in monitors. Helena does not contend that Lawrence and Townsley were not the true inventors of the claimed subject matter when the claims are so interpreted.

Helena frames an additional challenge to the '970 patent on the grounds that the named joint inventors did not jointly invent every claim in the '970 patent. SKD does not contest that fact; instead, it relies on the current patent statute, which provides:

Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent.

35 U.S.C. §116 (1982) (as amended by the Patent Law Amendments Act of 1984, Pub.

L. No. 98- 622, 98 Stat. 3383 (1984) (hereinafter, "the Act")). If this section applies to the '970 patent, Helena's challenge fails. We hold that section 116 applies.

The 1984 amendments made a number of substantive changes in the patent statute. Section 106(a) of the Act, *reprinted at* 35 U.S.C. §103 note (Supp. II 1984), states that with certain exceptions "the amendments made by this Act . . . shall apply to all United States patents granted before, on, or after the date of enactment [Nov. 8, 1984]." At least, *prima facie* , the 1984 amendment of section 116 applies to the '970 patent. Helena asserts, however, that it does not apply retroactively because of the exception provided in section 106(e). Section 106(e) states: "[T]he amendments made by this Act shall not affect the right of any party in any case pending in court on the date of enactment to have their rights determined on the basis of the substantive law in effect prior to the date of enactment." This case was pending on November 8, 1984, the date of enactment. The "substantive law" in effect on that date, per Helena, was that a patent was invalid for failure to name proper inventors unless the inventorship entity named was the true origin of *every* claim in a patent containing more than one claim, i.e., the "all claims" rule.

Helena's argument fails because the "all claims" rule was not uniformly accepted as "the substantive law" before the 1984 Act. *Compare In re Sarret* , 327 F.2d 1005, 1010 n.7, 140 USPQ 474 , 479 n.7 (CCPA 1964); *In re Hamilton* , 37 F.2d 758, 759, 4 USPQ 224, 227 (CCPA 1930); *Rival Mfg. Co. v. Dazey Prods. Co* ., 358 F.Supp. 91, 101, 177 USPQ 432, 439 (W.D. Mo. 1973); *Stewart v. Tenk* , 32 F. 665, 666 (S.D. Ill. 1887), *with United States v. Telectronics, Inc* ., 658 F.Supp. 579, 592, 3 USPQ2d 1571, 1580 (D. Colo. 1987); *Vekamaf Holland B.V. v. Pepe Benders, Inc* ., 211 USPQ 955, 966-67 (D. Minn. 1981); *SAB Industri AB v. Bendix Corp* ., 199 USPQ 95, 104 (E.D. Va. 1978). The 1984 amendment clearly repudiates the rule. *See generally* 1 D. Chisum, *Patents* , §2.03[3] at 2-25 to -28 (1987).

[4] We do not believe Congress intended, by the exception of section 106(e), to give a litigant a right to invoke the law of a particular circuit on joint inventorship or to preserve a conflict, even for a limited time, between circuits on this issue. Thus, we hold that section 106(e) does not negate the applicability of amended section 116 to the '970 patent and Helena's challenge fails.

C. *Infringement*

1. *Literal Infringement*

This court has repeatedly stated that direct infringement requires a two-step analysis. The claimed invention must first be defined, a legal question of claim interpretation. Second, the trier of fact must determine whether the claims, as properly interpreted, cover the accused device or process. The second step involves a question of fact. *See, e.g. Specialty Composites* , 845 F.2d at 986, 6 USPQ2d at 1603; *Envirotech Corp. v. Al George, Inc* ., 730 F.2d 753, 758, 221 USPQ 473, 477 (Fed. Cir. 1984); *Fromson v. Advance Offset Plate, Inc* ., 720 F.2d 1565, 1569, 219 USPQ 1137, 1140 (Fed. Cir. 1983). The burden is on SKD, as the patent owner, to prove infringement by a preponderance of the evidence. *See, e.g., Uniroyal, Inc* ., 837 F.2d at 1054, 5 USPQ2d at 1441. Such proof must show that every limitation of the patent claims asserted to be infringed is found in the accused device, either literally or by an equivalent. *See Pennwalt Corp. v. Durand-Wayland, Inc* ., 833 F.2d 931, 935, 4 USPQ2d 1737, 1739-40 (Fed. Cir. 1987) (in banc), *cert. denied* , 108 S.Ct. 1226, 1474 (1988).
We have already performed the first step of the analysis above and have determined that, properly interpreted, independent claims 1 and 5 cover hemoglobin as the positive monitor catalyst. 7 Based upon that interpretation, the second step of the analysis follows without extended commentary. There is no dispute that, before Helena changed its catalyst to lead acetate, Helena's slides contained hemoglobin as the positive monitor catalyst. Moreover, Helena does not contend that its accused product does not embody every other limitation of the asserted claims. Accordingly, any finding other than that the '970 patent claims literally read on Helena's slides containing hemoglobin would be clearly erroneous.

2. *Reverse Doctrine of Equivalents*

A finding that the words of the claims literally read on the accused device does not necessarily end the infringement inquiry. Although SKD has carried its burden and proven that the '970 patent claims asserted read on Helena's hemoglobin-containing slides, Helena may establish the fact of noninfringement by carrying its burden of going forward to show its device "has been so far changed in principle that it performs the same or similar function in a substantially-different way." *SRI Int'l* , 775 F.2d at 1123-24, 227 USPQ at 587; *see also Graver Tank & Mfg. Co. v. Linde Air Prods. Co* ., 339 U.S. 605, 608-09 [85 USPQ 328, 330-31] (1950). Helena has attempted to carry its burden by pointing to Dr. Lawrence's alleged admission that hemoglobin would not work. Helena's argument, which the district court accepted, 662 F.Supp. at 628, is that Dr. Lawrence's statement indicates hemoglobin operates in a substantially different way from the compounds SKD successfully used as positive monitor catalysts. As indicated above, Dr. Lawrence never stated that hemoglobin would not work as a catalyst. Claims 1 and 5 of the '970 patent cover compounds that react to environmental conditions in a manner similar to hemoglobin. We have held these claims to include hemoglobin itself as one possible catalyst. Thus, hemoglobin does not operate in a substantially different way from the compounds claimed -- which include hemoglobin -- and we reject Helena's argument based on the reverse doctrine of equivalents. 8

3. *Estoppel to Deny Infringement*

With respect to Helena's slides containing lead acetate as the catalyst in the positive monitor, SKD concedes those slides do not infringe the '970 patent either literally or under the doctrine of equivalents. SKD poses, however, a unique "infringement by estoppel" theory. In April 1984, Helena began marketing COLOSCREEN slides containing lead acetate in place of hemoglobin, but failed to alter a package insert stating that the positive monitor contained hemoglobin. The insert was not corrected until November 1985. SKD's theory is that Helena, by incorrectly identifying hemoglobin as the catalyst in the positive monitor, obtained sales to customers who would not otherwise have purchased Helena's product. Had customers known Helena's product did not contain a catalyst

similar to the hemoglobin the test was designed to discover, SKD argues, they would not have purchased Helena's product. Having obtained the benefit of such sales, Helena should be estopped, per SKD, from denying that the COLOSCREEN slides marketed between April 1984 and November 1985 contain hemoglobin. Accordingly, because slides containing hemoglobin infringe the '970 patent, the lead acetate slides, per SKD, infringe by estoppel.

The district court rejected SKD's position that these facts establish an estoppel. SKD's theory of estoppel rests on *Crane Co. v. Aeroquip Corp* ., 364 F.Supp. 547, 179 USPQ 596 (N.D. Ill. 1973), *aff'd in part & rev'd in part on other grounds* , 504 F.2d 1086, 183 USPQ 577 (7th Cir. 1974), and its assertion that the case is "completely analogous and should be followed in this case." In *Crane* , Crane licensed Aeroquip to manufacture pipe couplings under the former's patent. Aeroquip then modified its product, which the district court found did not infringe Crane's patent, but continued to place Crane's patent, but continued to place Crane's patent number on its modified couplings. Citing "marking estoppel" cases, 9 the district court found Aeroquip "estopped to deny that it is *liable for royalties* on [the modified] couplings." 364 F.Supp. at 560, 179 USPQ at 606-07 (emphasis added). The Seventh Circuit found that the modified couplings came within the scope of the claims and, thus, expressed "no opinion" on the marking estoppel issue. 504 F.2d at 1093, 183 USPQ at 581.

[5] Whatever the validity of the "marking estoppel" line of cases, we do not find *Crane* applicable to the present case. Helena never took a license under SKD's patent. Accordingly, *liability for royalty* payments is not at issue here. Helena did not place an erroneous patent number on its lead acetate product; it erroneously identified the catalyst used on its

product. The district court in *Crane* reached its result, in part, on the reasoning that

it should be recognized that application of the marking estoppel doctrine in this case should have an important therapeutic function in protecting the public interest. Manufacturers should be on notice that care must be taken in avoiding misrepresentation to the public that goods are protected by a patent.

364 F.Supp. at 560, 179 USPQ at 607. Such reasoning is inapplicable to this case.

35 U.S.C. §271(a) provides:

Except as otherwise provided in this title, whoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefore, infringes the patent."

Helena's lead acetate product is not the "patented invention" and, therefore, is not an infringement as defined by the statute. We do not accept the proposition that an *admittedly noninfringing* product can be converted by estoppel to an infringing product.

4. *Summary of Infringement Analysis*

Based on properly interpreted claims, Helena's slides which contain hemoglobin literally infringe the asserted claims of the '970 patent. The district court's finding of noninfringement is clearly erroneous, based as it is upon a legally erroneous interpretation of the asserted claims. We reverse that portion of the court's judgment finding noninfringement by Helena's hemoglobin-containing slides. With respect to Helena's slides containing lead acetate as the positive monitor catalyst, however, we agree with the court that SKD failed to carry its burden of proving infringement. Accordingly, we affirm the court's finding of noninfringement as to the lead acetate product.

D. *Inequitable Conduct*

In its cross appeal, Helena contends that the district court erred in failing to hold the '970 patent unenforceable. The grounds for Helena's charge of unenforceability are four alleged breaches of the duty to disclose material information, and to disclose that information accurately, to the PTO during prosecution of the '970 patent. *See* 37 C.F.R. §1.56 (1987). Such a breach may constitute inequitable conduct sufficient to render a patent unenforceable.

See, e.g., J.P. Stevens & Co. v. Lex Tex, Ltd ., 747 F.2d 1553, 1559, 223 USPQ 1089, 1092 (Fed. Cir. 1984), *cert. denied* , 474 U.S. 822 (1985); *American Hoist & Derrick Co. v. Sowa & Sons, Inc* ., 725 F.2d 1350, 1362-63, 220 USPQ 763, 773 (Fed. Cir.), *cert. denied* , 469 U.S. 821 [224 USPQ 520] (1984).

Having found no infringement, the district court apparently did not consider it necessary to reach the question of enforceability. Because we reverse the finding of noninfringement, the defense of inequitable conduct must be considered. When the pertinent facts are undisputed, as here, an appellate court need not remand for the trial court to make findings and conclusions but may resolve the issue. *See, e.g., Icicle Seafoods, Inc. v. Worthington* , 475 U.S. 709, 714 (1986); *UMC Elecs. Co. v. United States* , 816 F.2d 647, 657, 2 USPQ2d 1465, 1472 (Fed. Cir. 1987), *cert. denied* , 108 S.Ct. 748 (1988); *see also* 28 U.S.C. §2106 (1982) ("any . . . court of appellate jurisdiction . . . as may be just under the circumstances.").

To hold that a patentee has committed inequitable conduct, this court has uniformly held that *both* materiality and intent must be proven by clear and convincing evidence. *See, e.g., FMC Corp. v. Manitowoc Co* ., 835 F.2d 1411, 1415, 5 USPQ2d 1112, 1115 (Fed. Cir. 1987). Thus, "[t]o be guilty of inequitable conduct, one must have intended to act inequitably." *Id* . Proof of deliberate scheming is unnecessary; gross negligence may constitute sufficient wrongful intent to support a holding of inequitable conduct. *See Reactive Metals & Alloys Corp. v. ESM, Inc* ., 769 F.2d 1578, 1583-84, 226 USPQ 821, 825 (Fed. Cir. 1985).

[6] In the present case, however, there is no evidence of actual wrongful intent or gross negligence by the patentee. Helena's complete failure to present any evidence of intent likely follows its initial misunderstanding, which it later corrected, that "under the relevant case law, intent is not material to a determination of unenforceability, since Helena is *not* alleging fraud." As stated above, this court has uniformly held evidence of intent, not only material but, a *requirement* for a holding of inequitable conduct. Such evidence need not be direct, it may be inferred from the patentee's conduct. *See Hycor Corp. v. Schlueter Co* ., 740 F.2d 1529, 1538-39, 222 USPQ 553, 561-62 (Fed. Cir. 1984). Nevertheless, some evidence on the issue must exist.

Because Helena has failed to present any evidence, let alone clear and convincing evidence, that the '970 patent was procured by an applicant having withheld information through at least grossly negligent conduct, it has failed to raise a genuine issue for trial that the '970 patent is unenforceable.

E. *Helena's Other Defenses & Counterclaim*

On appeal it is Helena's burden to show not only that the district court erred, but also to persuade this court that had such error not occurred the result might have been different. *See, e.g* ., 28 U.S.C. §2111 (1982); *Cable Elec. Prod., Inc. v. Genmark, Inc* ., 770 F.2d 1015, 1021, 226 USPQ 881, 884 (Fed. Cir. 1985) ("Even assuming that such errors were committed [by the district court], Cable must demonstrate that if the errors were corrected, the application of the law to the facts present would produce a different result. In short, such errors as may be demonstrated must have further been harmful.") (citations omitted); *Gardner v. TEC Sys., Inc* ., 725 F.2d 1338, 1345, 220 USPQ 777, 782 (Fed. Cir.) (in banc) (courts of appeal shall disregard harmless errors which do not affect parties' substantive rights), *cert. denied* , 469 U.S. 830 [225 USPQ 232] (1984). None of Helena's other charges of error rise to that level. The remaining "errors" concern matters on which the court made no specific rulings.

Although Helena charged SKD with unfair competition, *inter alia* , from interference with customer and vendor relationships and from patent misuse, the evidence on these matters is so inconsequential that the district court apparently did not treat it as a viable issue. Similarly, the assertion that the case should be dismissed for lack of jurisdiction based on an absence of direct evidence that Helena sold infringing products at the time SKD brought suit is meritless. Indirect evidence from which such inference may be drawn is adequate. Having reviewed the

evidence called to our attention by Helena, we see no reason to remand for the district court to make specific rulings on these matters. No *prima facie* case was made out on any of them. Moreover, after the court issued its memorandum of findings of fact and conclusions of law without specific rulings, Helena failed to bring the alleged omissions to the trial court's attention. Helena's failure to give the court an opportunity to correct its alleged error in not ruling on these matters, under the circumstances here, could be deemed a waiver. Given their lack of substance, however, we are unpersuaded of prejudicial error in any event.

III

CONCLUSION

We affirm those portions of the district court's judgment holding claims 1, 2, 4, and 5 valid as between the parties, on different grounds. We also affirm that portion of the court's judgment finding that Helena's product containing lead acetate does not infringe the '970 patent. We reverse the portion of the court's judgment finding Helena's hemoglobin product noninfringing. We remand for calculation of damages.

COSTS

Each party shall bear its own costs of appeal.
MODIFIED IN PART, AFFIRMED IN PART, REVERSED IN PART, AND REMANDED .

Footnotes

Footnote 1. The '970 patent claims asserted to be infringed are:
. In an occult blood specimen test slide having a front panel, a rear panel, said front panel having one or more openings, sheet means carrying a test reagent between the front and rear panels underlying each of said openings, a hinged cover adapted to overlie a portion of the front panel and said openings and flap means in the rear panel opposite said openings and pivotable to expose the underside of the sheet, the improvement comprising: an area positioned on a portion of the sheet means facing the rear panel and isolated from the openings in the front panel, said area including a positive and negative monitor, said positive and negative monitors including the test reagent and said positive monitor additionally including a compound that reacts to environmental conditions in a manner similar to hemoglobin.
. The slide of claim 1 in which the compound in the positive monitor is a blood component and the test reagent is guaiac.
. The slide of claim 2 in which the positive and negative monitors are framed by a brightly colored inert border.
. In a method for determining the presence of occult blood in a specimen test slide having a guaiac treated specimen receiving sheet between a front panel and a rear panel with openings in the front and rear panels and pivotable covers to cover said openings which consists of smearing fecal matter onto the guaiac sheet through an opening of the front panel and applying a developing solution to the guaiac sheet at the corresponding opening in the rear panel the improvement which comprises further applying the developing solution to an area positioned on a portion of the sheet facing the rear panel and isolated from he openings in the front panel, said area including a positive and negative monitor, said positive and negative monitors including the guaiac and said positive monitor additionally including a compound that reacts to environmental conditions in a manner similar to hemoglobin.
Footnote 2. Record of Invention, SKD, Case No. 14084, at 1 (March 12, 1981). By "instability," Dr. Lawrence referred to the tendency of catalytic compounds to decay over time.
Footnote 3. Section 103 provides in relevant part:

A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Footnote 4. An appellate court may make a finding of fact on evidence that is undisputed. *See, e.g., King v. Commissioner of Internal Revenue* , 458 F.2d 245, 249 (6th Cir. 1972); *Sbicca-Del Mac, Inc. v. Milius Shoe Co* ., 145 F.2d 389, 400, 63 USPQ 249, 260 (8th Cir. 1944); 9 C. Wright & A. Miller, *Federal Practice & Procedure: Civil* §2577 at 699-701 (1971) ("[I]t is settled that findings are not jurisdictional and the appellate court may decide the appeal without further findings if it feels that it is in a position to do so. . . . A remand has been thought unnecessary if all the evidence is documentary or if the facts are undisputed.") (footnotes omitted); *cf. B.D. Click Co. v. United States* , 614 F.2d 748, 755 (Ct. Cl. 1980). An appellate court may also make such a finding even when the evidence is disputed if, as a matter of law, the court could only make one finding of fact or decide the fact in only one way. Otherwise, protracted litigation and unnecessary delay and expense would occur. *B.D. Click* , 614 F.2d at 755.

Footnote 5. We need not decide whether, had resolution of the factual inquiries presented a "clear and very strong case of obviousness," *EWP Corp. v. Reliance Universal Inc* , 755 F.2d 898, 907, 225 USPQ 20, 25 (Fed. Cir.), *cert. denied* , 474 U.S. 843 (1985), rather than nonobviousness, the objective evidence provided would have outbalanced that case and shown nonobviousness.

Footnote 6. The patent statute provides that "whoever invents or discovers" the patentable subject matter "may obtain a patent therefor." 35 U.S.C. §101 (1982).

Footnote 7. Having construed the claims one way for determining validity, it is axiomatic that the claim must be construed in the same way for infringement. *W.L. Gore & Assocs., Inc. v. Garlock, Inc* ., 842 F.2d 1275, 1279, 6 USPQ2d 1277, 1280 (Fed. Cir. 1988); *Kimberly-Clark Corp. v. Johnson & Johnson* , 745 F.2d 1437, 1449, 223 USPQ 603, 610 (Fed. Cir. 1984); *cf. Autogiro Co. of Am. v. United States* , 384 F.2d 391, 399, 155 USPQ 697, 704 (Ct. Cl. 1967) (patentee cannot construe claims narrowly before Patent Office and later broadly before court).

Footnote 8. Because we have decided that Helena's accused product containing hemoglobin as the positive monitor catalyst literally infringes the '970 patent claims, we need not and do not review the district court's analysis of infringement under the doctrine of equivalents.

Footnote 9. We note the line of cases sometimes called "marking estoppel" cases, in which, under some circumstances, a party that marks its product with a patent number is estopped from asserting that the product is not covered by the patent. *See, e.g., Gridiron Steel Co. v. Jones & Laughlin Steel Corp* ., 361 F.2d 791, 796-97, 149 USPQ 877, 880-81 (6th Cir. 1966); *Collis Co. v. Consolidated Mach. Tool Corp* ., 41 F.2d 641, 645, 6 USPQ 109, 113 (8th Cir.), *cert. denied* , 282 U.S. 886 (1930); *Piaget Novelty Co. v. Headley* , 108 F. 870, 872 (2d Cir. 1901).

- End of Case -

FULL TEXT OF CASES (USPQ FIRST SERIES)

In re Regel, Buchel, and Plempel

(CCPA)
188 USPQ 136
Decided Dec. 18, 1975
No. 75-570
U.S. Court of Customs and Patent Appeals

Headnotes

PATENTS

1. Patentability — Composition of matter (§ 51.30)

Patentability — Invention — Specific cases — Chemical (§ 51.5093)
Finding of unobviousness of compound depends on comparing old and new compounds as wholes, inclusive of their properties, since compound and properties are inseparable.

2. Patentability — Anticipation — Combining references (§ 51.205)

Patentability — Composition of matter (§ 51.30)

Patentability — Invention — Specific cases — Chemical (§ 51.5093)
There must be some logical reason apparent from positive, concrete evidence of record that justifies combination of primary and secondary references; "mere fact that it is possible to find two isolated disclosures which might be combined in such a way to produce a new compound does not necessarily render such production obvious unless the art also contains something to suggest the desirability of the proposed combination."

Particular patents — Salts
Regel, Buchel, and Plempel, Bis-imidazolyl-bisphenylmethane, Salts Thereof and Processes for Their Production, rejection of claims 2 and 6 reversed.

Case History and Disposition:

Appeal from Patent and Trademark Office Board of Appeals.

Application for patent of Erik Regel, Karl Heinz Buchel, and Manfred Plempel, Serial No. 873,098, filed Oct. 31, 1969. From decision rejecting claims 2 and 6, applicants appeal. Reversed.

Attorneys:

Albert L. Jacobs, Jr., and Jacobs & Jacobs, both of New York, N.Y., for appellants.

Joseph F. Nakamura (Jack E. Armore, of counsel) for Commissioner of Patents and Trademarks.

Judge:

Before Markey, Chief Judge, and Rich, Baldwin, Lane, and Miller, Associate Judges.

Opinion Text

Opinion By:

Baldwin, Judge.

This is an appeal from the decision of the Patent and Trademark Office Board of Appeals affirming the examiner's rejection of claims 2, 6 and 19 [1] of appellants' application [2] entitled "Bis-imidazolyl-bisphenylmethane, Salts Thereof and Processes for Their Production." We reverse.

The Invention

Appellants claim certain derivatives of bis-imidazolyl-bisphenylmethane which are disclosed as being non-toxic and pharmaceutically acceptable antimycotics especially useful against dermatomycosis and also against yeast infections of the skin and internal organs. The claims on appeal are as follows:

2. A compound of the formula:

Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.

wherein

R 1is hydrogen, alkyl of 1 to 4 carbon atoms or phenyl,

R 2and R 3are the same or different and are hydrogen, alkyl of 1 to 4 carbon atoms or phenyl,

X and Y are the same or different and are halogen, NO 2, CN, alkyl of 1 to 12 carbon atoms,

S-alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, and

m is 0, 1 or 2, and

n is 1 or 2 or m is 1 or 2 and n is 0, 1 or 2.

6. A compound according to claim 2 wherein R 1is hydrogen or alkyl of 1 to 4 carbon atoms, R 2and R 3are hydrogen, X and Y are the same or different and are halogen, CN, NO 2, methoxy or methyl and n is 0 or 1.

References

Fournari et al., Bull. Soc. Chim. France, No. 356 (1968), pages 2438-46 (hereafter Fournari).

Mussell et al. 3,321,366, May 23, 1967 (filed Nov. 15, 1965) (hereafter Mussell).

Tolkmith et al., Science, Vol. 158 (1967), pages 1462-63 (hereafter Tolkmith).

Fournari discloses various methods of preparing N-substituted imidazole derivatives. Once prepared, the spectra of the various imidazoles were analyzed to determine the exact chemical structures of the compounds. Of the numerous materials studied, three were found of particular interest by the Patent and Trademark Office in formulating its rejection (which will be discussed in detail):

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C imidazolyl [3] 3 C imidazolyl 22 C imidazolyl 3

Mussell discloses the use of certain substituted tritylimidazole compounds [4] "for the

control of a wide range of fungi, especially those fungal organisms ordinarily found on the aerial portions of plants." In addition, Mussell teaches that:

> It is an advantage of the present invention that compositions containing these compounds can be applied to growing vegetation in amounts required for effective control without significant injury to the plants. It is a further advantage that the compounds of the present invention are of very low toxicity to mammals.

Last, the Tolkmith article presents the results of a study of certain substituted imidazoles and concludes that:

> [I]midazoles substituted on the imine nitrogen atom are likely to be active if the substituent is electron-attracting, and if the atom connecting it to the imidazolyl moiety has tetrahedral geometry. Fungitoxicity is high with phosphinamidothionate and triarylmethyl groups as substituents. The presence of an asymmetric phosphorus atom in the substituent has no effect on fungitoxicity, but affects mammalian toxicity.

Tolkmith began by studying the properties of N,N-diethyl imidazol-l-yl phenylphosphinamidothionate 5and noted that it "showed high fungitoxicity, low mammalian toxicity, and very little anticholinergic activity." It was then hypothesized that the fungitoxic action of the above-recited compound should not be drastically changed if the entire phosphinamidothionate group were replaced by a phosphorus-free substituent of equivalent stereoelectronic nature. In order to test this hypothesis, several materials were tested, including:

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The tritylimidazole was found to be nearly as active as the reference compound, while demonstrating "moderate mammalian toxicity."

The Rejection

The board affirmed the examiner's rejection of claims 2 and 6 as being unpatentable (35 USC 103) over (1) Fournari, (2) Fournari in view of Mussell, and (3) Fournari in view of Mussell and Tolkmith. Noting that Fournari does not disclose any utility for the compounds recited therein, the board stated:

> At the outset we point out that appellants' invention (i.e., that which is claimed) is a chemical compound or group of compounds; it is not the method of using the compound or of treating humans or animals infected with pathogenic fungi.
>
> Our consideration of the references convinces us that not only would the claimed alkyl or methyl analogue have been obvious, its usefulness as a fungicide also would have been equally obvious. For example, Tolkmith et al. indicate that the fungicidal activity is primarily due to the imidazole moiety of the compound and that the remainder of said compound (a triphenylmethyl group in the case of compound II)

"is not in fact critical for high fungicidal activity." Mussell et al. additionally indicate that in imidazole-substituted phenylmethane fungicides both the methyl-substitued phenyl and unsubstituted phenyl derivatives possess fungicidal activity. Consequently anyone skilled in the art would expect not only the Fournari et al. bis-imidazolyl-bisphenylmethane to possess fungicidal activity but would also expect similar activity for the corresponding methyl-substituted analogue.

Regarding appellants' argument based on the fact that the art does not suggest the treatment of fungal infections pathogenic to human beings and other animals, it is the Examiner's position that this fact, under the circumstances herein, is not significant. As we have set forth above, the claimed methyl analogue of the Fournari et al. bis-imidazolyl-bis-phenylmethane, as well as its use as a fungicide would have been obvious from the art of record. In other words this means that the claimed methyl analogue, as well as its use as a fungicide, would have already been in the possession of the public at the time appellants made their invention. The fact that appellants may

have discovered a new specific use for that which is already in the possession of the public does not entitle them to a patent thereon. In effect appellants seek to exclude the public from the use of a chemical compound for any purpose including the use as a fungicide (e.g., as against *Phytophthora infestans, Diplocarpon rosae, Sphaerotheca panossa, Erysiphe cichoracearum*) when said compound and its use are already in the public domain; Monsanto Company v. Rohm and Haas Company, supra (164 USPQ at 565).

On reconsideration, it added:

We remain of the view that appellants have not established in this record any unobvious properties of the claimed class of compounds as a whole nor have they established any unexpected improvement in properties not possessed by the art compounds.

In response to these rejections, appellants submitted to the Patent and Trademark Office two declarations under Rule 132. The first attempted to establish unexpected properties of the methyl analogue of bis-imidazolyl-bisphenylmethane as compared to the corresponding unsubstituted imidazole. The second was submitted by appellants with their reply brief before the board; it was not considered "since it has not been indicated nor seen to be limited to new points of argument in the Examiner's Answer." No further discussion of these declarations is deemed necessary as neither is relied upon in rendering our decision.

Opinion

[1] As quoted, supra, the board raised the point that appellants' invention (i.e., that which is claimed) is a chemical compound or group of compounds, not the method of using them in treating humans or animals infected with pathogenic fungi. However, this court on numerous occasions has held that a compound and its properties are inseparable. In re Albrecht, 514 F.2d 1389, 185 USPQ 585 (CCPA 1975); In re Murch, 59 CCPA 1277, 464 F.2d 1051, 175 USPQ 89 (1972); In re Stemniski, 58 CCPA 1410, 444 F.2d 581, 170 USPQ 343 (1971); In re Papesch, 50 CCPA 1084, 315 F.2d 381, 137 USPQ 43 (1963). A finding of unobviousness in consequence depends on comparing the old and new compounds as wholes, inclusive of their properties. In re Albrecht, supra.

[2] Although the board affirmed the rejection of claims 2 and 6 as being obvious in view of (1) Fournari, (2) Fournari in view of Mussell, and (3) Fournari in view of Mussell and Tolkmith, we will restrict our discussion to the last-recited rejection — clearly the Office's strongest position. This assumes that the three cited references are combinable, an assumption that we will make, although not without reservation. [5]

Fournari discloses numerous compounds, one of which happens to be bis-imidazolyl-bisphenylmethane. The solicitor characterized this compound as the "parent" of the compounds encompassed by the appealed claims. We read this to imply that when a hindsight selection of possible "R's", "X's", "Y's", "m's" and "n's" is made in appellant's claims 2 and 6, it can be made to appear that Fournari differs from appellants' claimed compounds by

an alkyl group on one of the phenyl radicals. Therefore, we are faced with the question whether the secondary references, i.e., Mussell and Tolkmith, disclose enough to render obvious that which is missing in Fournari — the missing alkyl substitution.

Mussell only discloses tritylimidazole compounds. Although the patentees do teach unsubstituted and lower alkyl substituted phenyl radicals, the imidazoles disclosed are those possessing a single imidazole group and three phenyl groups. Furthermore, notwithstanding the board's characterization of Mussell's compounds as possessing "fungicidal activity," we find that such activity is limited to the control of fungi found on plants. As stated by Mussell:

> It has been discovered that the tritylimidazole compounds are particularly adapted to be employed for the control of a wide range of fungi, especially those fungal organisms ordinarily found on the aerial portions of plants, such as, for example, cherry leaf spot, black spot, apple scab, rice blast, powdery mildew,

> Helminthosporium (leaf spot on grasses, cereals, and corn), and late blight. The compounds can also be applied in dormant applications to the woody surfaces of plants or to orchard floor surfaces for the control of the overwintering spores of many fungi. In addition, the tritylimidazole compounds can be applied to seeds to protect the seeds from the attack of fungal organisms such as rot and mildew. Also, the tritylimidazole compounds can be distributed in soil at fungicidal concentrations to control the organisms which attack seeds and plant roots, particularly the fungal organisms of root rot and mildew.

Tolkmith represents a rather complex study, clearly directed towards a theoretician. The results of the study, presented in abstract form, are as follows:

> Abstract. Study of several new types of fungitoxic derivatives of imidazole reveals that imidazoles substituted on the imine nitrogen atom are likely to be active if the substituent is electron-attracting, and if the atom connecting it to the imidazolyl moiety has tetrahedral geometry. Fungitoxicity is high with phosphinamidothionate and triarylmethyl groups as substituents. The presence of an asymmetric phosphorus atom in the substituent has no effect on fungitoxicity, but affects mammalian toxicity.

Both the solicitor and the board rely on Tolkmith for its alleged conclusion that fungicidal activity is primarily due to the imidazole moiety. Although we can find no such verbatim statement in Tolkmith, we surmise that the following language is that which the board had in mind:

> [F]ungitoxic action seemed more likely to result from the nucleophilicity of I [7], that is, from the power of the azole nitrogen of the imidazolyl group to attack an electrophilic site in the fungus organism by donating electrons to this site.

Our reading of Tolkmith leads us to a different conclusion.

Tolkmith presents four compounds which were studied for fungicidal activity. All four possess imidazole moieties, but only compound II, an unsubstituted tritylimidazole, was "nearly as active" as the reference compound N, N-diethyl imidazol-l-yl phenylphosphinamidothionate — two others "were markedly less fungicidal." The only conclusion presented in the Tolkmith article is that imidazoles substituted on the imine nitrogen atom are likely to be active if the substituent is electron-attracting, and if the atom connecting it to the imidazolyl moiety has tetrahedral geometry.

Last, Tolkmith's disclosed utility for the active compounds studied is that of "foliage fungicides." Compound II, relied upon by the board, is taught by Tolkmith to have "show[n] moderate mammalian toxicity."

When we combine the information gleaned from each reference, we are apprised of the following. First, methanes substituted with one, two or three unsubstituted imidazolyls and one, two or three unsubstituted phenyls are known (Fournari). Second, tritylimidazoles with lower alkyl substitution on the phenyl moieties are known as

fungicides for plants (Mussell). Third, imidazoles substituted on the imine nitrogen atom are likely to be active foliage fungicides if the substituent is electron-attracting, and if the atom connecting it to the imidazolyl moiety has tetrahedral geometry (Tolkmith). Fourth, and last, tritylimidazole is an active foliage fungicide that exhibits moderate mammalian toxicity (Tolkmith).

We cannot agree with the board that the information derived from the references, taken as a whole, would render obvious claims 2 and 6 which are directed toward substituted bisimidazolyl-bisphenylmethanes disclosed as being pharmaceutically acceptable and useful as antimycotics especially against dermatomycosis caused by Trichophyton and Microsporium species and also against yeast infections of the skin and internal organs. Accordingly, the decision of the board is reversed.

Footnotes

Footnote 1. Claim 19 was rejected under 35 USC 112, second paragraph. Further discussion of this claim is unnecessary. Appellants have withdrawn their appeal of claim 19 by motion dated June 5, 1975.

Footnote 2. Serial No. 873,098, filed October 31, 1969.

Footnote 3. The chemical structure of the imidazolyl group is:

Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.

Footnote 4. Mussell's tritylimidazoles are taught to have the following generic structure:

Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.

wherein each R independently represents a member selected from the group consisting of halo and lower alkyl and n represents an integer of from 0 to 2, both inclusive, further limited in that one of the 2 and 6 positions is unsubstituted; and each X independently represents hydrogen, lower alkyl, or phenyl, the total number of carbon atoms in all X substituents being an integer of from 0 to 15, both inclusive.

Footnote 5. As we have stated in the past, there must be some logical reason apparent from positive, concrete evidence of record which justifies a combination of primary and secondary references. In re Stemniski, supra. Further, as we stated in In re Bergel, 48 CCPA 1102, 1105, 292 F.2d 955, 956, 130 USPQ 206, 208 (1961):

> The mere fact that it is *possible* to find two isolated disclosures which might be combined in such a way to produce a new compound does not necessarily render such production obvious unless the art also contains something to suggest the desirability of the proposed combination.

In the present case, it may reasonably be argued that because Fournari discloses no suggestion of utility for the compounds recited therein, one of ordinary skill in the art would not be prompted to combine this reference with either Mussell or Tolkmith.

Compound I of Tolkmith is as follows:

Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.

- End of Case -

FULL TEXT OF CASES (USPQ2D)
All Other Cases

In re Gergen (CA FC) 11 USPQ2d 1652

In re Gergen

U.S. Court of Appeals Federal Circuit
11 USPQ2d 1652

Decided April 24, 1989
No. 89-1009

Unpublished Opinion

Headnotes

PATENTS

1. Patentability/Validity -- Obviousness -- Combining references (§ 115.0905)

Board of Patent Appeals and Interferences erred as matter of law in finding applicant's modified block copolymer unpatentable as obvious under 35 USC 103.

Case History and Disposition:

Appeal from Patent and Trademark Office, Board of Patent Appeals and Interferences.

William P. Gergen and Robert G. Lutz appeal rejection of claims 1-10 and 28-30 in application for patent, serial no. 766,217, filed Aug. 16, 1985. Reversed.

Judge:

Before Nichols, senior circuit judge, and Friedman and Smith, circuit judges.

Opinion Text

Opinion By:

Smith J.

William P. Gergen and Robert G. Lutz (Gergen) appeal the decision of the United States Patent and Trademark Office Board of Patent Appeals and Interferences (board) affirming the examiner's rejection of claims 1-10 and 28-30 in Gergen's application for a patent, serial No. 766,217, entitled "Modified Block Copolymers," which application was filed August 16, 1985. We *reverse* .

OPINION

Gergen's claimed invention involves functionalized, selectively hydrogenated block copolymers containing conjugated diene blocks and monovinyl arene blocks. The block copolymer is functionalized by grafting onto the copolymer's monovinyl arene blocks at least one electrophilic graftable molecule selected from the group consisting of carbon dioxide, carboxylic acids, their salts and esters. Claim 1, the broadest claim on appeal, reads:

1. A functionalized selectively hydrogenated block copolymer of the formula Bn(AB)oAp where n = o or 1, o = 1 to 50, p = O or 1, A is predominately a polymerized monoalkenyl aromatic hydrocarbon block and B prior to hydrogenation is predominately a polymerized conjugated diene hydrocarbon block to which has been grafted at least one electrophilic graftable molecule or electrophile wherein substantially all of said graftable molecules are grafted to the block copolymer and said electrophile is selected from the group consisting of carbon dioxide, carboxylic acids, their salts and esters in the vinylarene blocks.

Claims 1-10 and 28-30 were rejected under 35 U.S.C. §103 as unpatentable over United States patent No. 4,471,099 (Trepka) in view of United States patent No. 4,409,357 (Milkovich). The examiner and the board each concluded that it would have been obvious in view of the Milkovich reference to utilize any of the agents of Milkovich, *e.g* ., carbon dioxide, in functionalizing the hydrogenated block copolymers of Trepka. We disagree.

The primary reference of Trepka discloses functionalized hydrogenated copolymers, useful as dispersant viscosity index improvers or as gasoline detergent additives, with the same basic structure as that of the Gergen copolymers. However, in contrast to the Gergen copolymers, the Trepka reference teaches, as its functionalizing molecule, a nitrogen-containing organic compound, such as p-dimethylaminobenzaldehyde.

The secondary reference of Milkovich describes copolymers, useful as shoe sole compounds, which copolymers are structurally different from both the Gergen copolymers and the Trepka copolymers. The Milkovich copolymers are highly branched block copolymer, sometimes referred to as starblock copolymers, which contain polar functional groups in the nucleus of the copolymers. Among the functional groups taught by Milkovich are, *inter alia* , carbon dioxide, various aldehydes, and dicarboxylic acid dihalides.

[1] As we have previously stated, "[t]he mere fact that it is *possible* to find two isolated disclosures which might be combined in such a way to produce a new compound does not necessarily render such production obvious unless the art also contains something to suggest the desirability of the proposed combination." *In re Grabiak* , 769 F.2d 729, 732, 226 USPQ 870, 872 (Fed. cir. 1985) (quoting *In re Bergel* , 292 F.2d 955, 956-57, 130 USPQ 206, 208 (CCPA 1961 (emphasis in original)). "[T]here must be some logical reason apparent from positive, concrete evidence of record which justifies a combination of primary and secondary references." *In re Regel* , 526 F.2d 1399, 1403 n.6, 188 USPQ 136 , 139 n.6 (CCPA 1975).

In this case, there is no prior art teaching that suggests the interchangeability of a nitrogen-containing compound for carbon dioxide or any other nonnitrogen-con

taining compound in the functionalization of the Trepka copolymer. Trepka, which limits its functionalizing molecule to a nitrogen-containing compound, does not suggest the use of carbon dioxide or carboxylic acid. Further, Milkovich does not provide any teaching or suggestion to use its functional groups, *e.g* ., carbon dioxide, with any block copolymer other than the star-block copolymer taught by Milkovich. Accordingly, we hold that the board erred as a matter of law in concluding that Gergen's claimed invention would have been obvious to one of ordinary skill in the art under section 103.

- End of Case -

Intellectual Property Library ISSN 1526-8535

FULL TEXT OF CASES (USPQ FIRST SERIES)

In re WESSLAU

(CCPA)
147 USPQ 391

Decided Nov. 26, 1965
Appl. No. 7447
U.S. Court of Customs and Patent Appeals

Headnotes

PATENTS

1. Patentability--Composition of matter (§ 51.30)

Claims to process of polymerizing ethylene are not rejected on theory that applicant's catalyst system can be met merely by substitution of groups from two prior patents on the corresponding components of a third prior system since no one of the references suggests such a substitution, quite apart from the result which would be obtained thereby; such piecemeal reconstruction of prior art patents in light of applicant's disclosure is contrary to 35 U.S.C. 103.

2. Patentability--Invention--In general (§ 51.501)

Question in cases within ambit of 35 U.S.C. 103 is whether subject matter as a whole would have been obvious to one of ordinary skill in the art following teachings of prior art at time invention was made; it is impermissible within framework of section 103 to choose from any one reference only so much of it as will support a given position, to exclusion of other parts necessary to full appreciation of what reference fairly suggests to one of ordinary skill in the art.

Particular patents--Polyethylene

Wesslau, Process for the Production of Polyethylene with Narrow Distribution of the Molecular Weight, claims 35 to 43 of application allowed.

Case History and Disposition:

Appeal from Board of Appeals of the Patent Office.

Application for patent of Hermann Wesslau, Serial No. 753,872, filed Aug. 8, 1959; Patent Office Group 140. From decision rejecting claims 35 to 43, applicant appeals. Reversed.

Attorneys:

ARNOLD SPRUNG, New York, N.Y., and ARNOLD B. CHRISTEN, Washington, D. C., for appellant.

CLARENCE W. MOORE (FRED W. SHERLING of counsel) for Commissioner of Patents.

Judge:

Before WORLEY, Chief Judge, and RICH, MARTIN, SMITH, and ALMOND, Associate Judges.

Opinion Text

Opinion By:

ALMOND, Judge.

This appeal is from the decision of the Board of Appeals affirming the rejection of claims 35-43 [1] in appellant's application [2] entitled "Process for the Production of Polyethylene With Narnow Distribution of the Molecular Weight." No claims have been allowed.

The invention relates to a process of polymerizing ethylene utilizing a Ziegler-type catalyst system to produce solid polyethylene. Both appellant and the Patent Office have treated the appealed process claims as standing or falling together, and we will do the same. Claim 35, from which the remaining claims depend, is illustrative and reads as follows:

> 35. In the process of polymerizing ethylene to a solid polymer having a high molecular weight and a narrow molecular weight distribution range, the improvement which comprises polymerizing ethylene in the presence of a polymerization catalyst con

> sisting essentially of a mixture of titanium trichloride, at least one compound of tetravalent titanium Ti(R) 4and at least one organic aluminum compound soluble in a liquid hydrocarbon and having the general formula R'Al(R) 2in which R' is alkyl and R is selected from the group consisting of halogen, alkoxy and aroxy radicals, wherein between said tetravalent titanium compound and said organic aluminum compound there is present in said mixture at least one halogen atom and at least one member selected from the group consisting of alkoxy and aroxy radicals.

According to appellant's disclosure, polyethylene of high molecular weight may be produced by what has become known in the art as the Ziegler polymerization process. Analysis of the polyethylene so produced has revealed that although the *average* molecular weight of the polymer is high, a fairly large proportion of the individual polymer chains have a relatively low molecular weight. These low molecular weight fractions are

particularly unfavorable for such properties as impact bending strength, rubbing, and fatigue. Appellant has discovered that the proportion of the lower molecular weight chains can be reduced, thereby narrowing the molecular weight distribution, by employing a three-component catalyst system in which either the $Ti(R)_4$ or $R'Al(R)_2$ contains an alkoxide or aroxide moiety.

The references relied on are:

Anderson 2,862,917 December 2, 1958
Muehlbauer 2,905,661 September 22, 1959
Ruhrchemie (Belgian) 553,694 June 24, 1957

The Ruhrchemie patent relates to a process for producing polyethylene of a desired molecular weight employing certain specified catalyst systems. The pertinent portion of the patent specification reads as follows:

> * * * when high molecular weight [polyethylene] products are to be obtained * * *, the employed mixtures consist of aluminum alkyl compounds and/or halides of aluminum alkyl with quantities of titanium trichloride of at least 0.01 mole * * * and quantities of titanium tetrachloride lower than 0.01 mole * * *; on the other hand, when materials having low molecular weight are to be obtained the employed mixtures consist of aluminum alkyl and/or halide of aluminum alkyl with more than 0.1 mole * * * of titanium tetrachloride per mole of aluminum alkyl and/or halide of aluminum alkyl, and with titanium trichloride at the rate of at least 0.1 mole, preferably 0.3-1 mole approximately per mole of aluminum alkyl and/or halide of aluminum alkyl.

The Anderson patent relates to a process of polymerizing ethylene whereby control over the weight average molecular weight of the polymer and the *molecular weight distribution* of the polymer is achieved by adhering to process conditions which insure the solubility of the ethylene during polymerization. The process employs coordination catalysts of titanium:

> * * * obtained by admixing a trivalent or tetravalent titanium compound of the class consisting of titanium salts and titanium alkoxides with a compound having at least one metal-to-hydrocarbon bond, such as metal alkyls, suitable compounds being lithium aluminum alkyls, aluminum alkyls, Grignard reagents, alkyl aluminum halides, tin alkyls, etc. * * *

Anderson further states:

> * * * the steady state compliance [an indicia of molecular weight distribution] will vary from 3 to 7 when the critical conditions of the process of the present invention are maintained and will rise to a range of 12 to 28 when the polymerization is carried out at conditions other than required by the process of the present invention. * * *

Muehlbauer relates to a process for producing high molecular weight polyolefins employing a two-component catalyst system consisting of certain metal halides and a compound of the formula XAlR(OR'), where X is halogen, and R and R' are the same or different alkyl, cycloalkyl, or aryl radicals. Titanium trichloride and titanium tetrachloride are specifically disclosed as suitable metal halides.

The sole issue in this case is obviousness under 35 U.S.C. 103.

Appellant's principal contention is that:

> * * * since none of the reference[s] either singly or in combination teach a control of the molecular weight distribution range by specific selection of catalyst components, or even that the nature or composition of the catalyst could have an effect on this molecular weight distribution range, the subject matter of the invention as a whole could not possibly be obvious from the references. * * *

We agree. Appellant's specification contains ten examples in which various three-component catalyst systems

were utilized in the polymerization of ethylene. The systems set forth in three of these examples consisted of (1) titanium trichloride, (2) titanium tetrachloride, and (3) diethyl aluminum monochloride is various molar ratios. These fall within the catalyst systems disclosed by Ruhrchemie. The U value, which according to appellant's specification is a measure of the molecular weight distribution, ranges from 6.3 to 12.8 for such catalysts. In the remaining seven examples, catalyst systems covered only by the appealed claims were employed, with the nonuniformity value U [3] for the resultant polyethylene ranging from 2.6 to 3.9 We believe this to be a convincing demonstration that the alkoxide or aroxide moiety, when present in the catalyst systems of the appealed claims, possesses the property of conferring a significant degree of control over the ultimate molecular weight distribution of polyethylene. This property is neither taught nor suggested by the prior art.

The reasoning of the examiner and the board appears to be as follows: Ruhrchemie discloses a titanium trichloride - titanium tetrachloride - mono - ethyl aluminum dichloride system. This differs from appellant's system only in the latter's use of an alkoxide or aroxide group on either the tetravalent titanium or aluminum component or both. Since Anderson shows a tetravalent titanium compound containing an alkoxide group and Muehlbauer shows an aluminum compound containing an alkoxide group, appellant's catalyst system can be met merely by substitution of such alkoxide groups on the corresponding components of the Ruhrchemie system.

[1] The fallacy of this reasoning is that no one of the references *suggests* such a substitution, quite apart from the result which would be obtained thereby. Such piecemeal reconstruction of the prior art patents in the light of appellant's disclosure is contrary to the requirements of 35 U.S.C. 103. In re Rothermel, 47 CCPA 866, 276 F.2d 393, 125 USPQ 328 .

[2] The ever present question in cases within the ambit of 35 U.S.C. 103 is whether the subject matter as a whole would have been obvious to one of ordinary skill in the art following the *teachings* of the prior art at the time the invention was made. It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The Anderson patent is the only reference before us which recognizes the desirability of producing polyethylene with a narrow molecular weight distribution range. Were one to follow the teachings of that patent in its entirety, he would be led to believe that control over the molecular weight distribution of polyethylene was gained independently of the catalyst system, a belief untenable in light of appellant's disclosure.

Both the board and the solicitor apparently assert the position that it is incumbent upon appellant to show that his results are outstanding as compared with the results accomplished by Anderson and Muehlbauer. If this is construed as requiring appellant to show unexpected results accruing from his claimed process, we think he has met the requirement. We perceive no teaching in the prior art of record suggesting that an alkoxide or aroxide moiety in a Ziegler-type catalytic system would produce the results obtained by appellant's process.

The decision of the board is *reversed.*

Footnotes

Footnote 1. Appellant withdrew the appeal with respect to the only product claim 44, which was drawn to a polyethylene having a narrow molecular weight distribution characterized by a nonuniformity value U of magnitude between 2 and 4.

Footnote 2. Serial No. 753,872, filed August 8, 1958.

Footnote 3. Appellant's specification contains the following description of the nonuniformity value U:

> * * * the so-called non-uniformity is used for characterising the range of distribution of the molecular weights. According to G. V. Schulz in H. A. Stuart's Die Physik der Hochpolymeren, 2nd vol., the macromolecule in solutions is given on page 754 as:
> *Graphic material consisting of a complex mathematical formula set at this point is not available. See text*

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'M $_{W}$and 'M $_{n}$can be calculated from the molecular weight distribution by current methods (G. V. Schulz and M. Marx: Makromolekulare Chemie XIV (1954), pages 53-64).

- End of Case -

Intellectual Property Library ISSN 1526-8535

FULL TEXT OF CASES (USPQ FIRST SERIES)

Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.

(CA FC)
230 USPQ 416
Decided July 14, 1986
No. 85-2578
U.S. Court of Appeals Federal Circuit

Headnotes

PATENTS

1. Patentability -- Invention -- In general (§ 51.501)

Federal district court erred by holding laser-marked contact lens patent to be invalid, in view of court's failure to grant patent its statutory presumption of validity, its over-reliance upon inventor's alleged opinion as to non-obviousness, its misuse of such opinion as substitute for determining level of skill of hypothetical person of ordinary skill, its use of improper hindsight analysis, its failure to consider prior art reference in its entirety, and its erroneous reliance upon irrelevant experiments.

2. Infringement -- Tests of -- Comparison with claim (§ 39.803)

Federal district court erred in its finding of non-infringement of contact lens patent, since court, in considering whether accused lenses were "smooth" like patented lenses, did not construe meaning of term "smooth" by resorting to specification, but instead distorted patent's claims by assessing smoothness according to approach that exceeded level of smoothness required in claim.

Particular patents -- Contact Lenses

4,194,814, Fischer, McCandless, and Hager, Transparent Ophthalmic Lens Having Engraved Surface Indicia, holding of invalidity and non-infringement vacated.

Case History and Disposition:

Appeal from District Court for the Northern District of California, Aguilar, J.; 226 USPQ 780 .

Action by Bausch & Lomb, Inc., against Barnes-Hind/Hydrocurve, Inc., and Barnes-Hind International, Inc., for patent infringement, in which defendants counterclaim for declaration of patent invalidity and non-infringement. From judgment for defendants, plaintiff appeals. Vacated and remanded.

Attorneys:

Laurence H. Pretty, and Pretty, Schroeder, Brueggemann & Clark, both of Los Angeles, Calif. (Craig S. Summers, Bernard D. Bogdin, and Howard S. Robbins, all of Rochester, N.Y., on the brief) for appellant.

John M. Calimafde, and Hopgood, Calimafde, Kalil, Blaustein & Judlowe, both of New York, N.Y. (Eugene J. Kalil, Dennis J. Mondolino, and Gilbert W. Rudman, all of Tuckahoe, N.Y., on the brief) for appellees.

Judge:

Before Markey, Chief Judge, Friedman, Circuit Judge, and Nichols, Senior Circuit Judge.

Opinion Text

Opinion By:

Nichols, Senior Circuit Judge.

Appellant Bausch & Lomb, Inc. filed suit in the United States District Court for the North

ern District or California, alleging that appellee Barnes-Hind/Hydrocurve, Inc. and Barnes-Hind International, Inc. (hereinafter Barnes-Hind) infringed patent No. 4,194,814 ('814 patent) in the manufacture and sale of its laser-marked contact lens. Barnes-Hind denied infringement and counterclaimed that the '814 patent was invalid, void, and unenforceable. In No. C-83-20283-RPA, Judge Aquilar found the patent invalid for obviousness and not infringed. We vacate and remand.

Appellee Barnes-Hind relied to a large extent on deposition testimony which was never introduced into evidence. Because this testimony was not in evidence, it would have been improper for us to consider it and, therefore, we did not. This eliminated much of Barnes-Hind's arguments on appeal.

Background

1. *The Technology*

Vision correcting contact lenses have become familiar; hard contact lenses were introduced in the early 1950's and soft lenses in 1971. Toric contact lenses, which correct for the eye condition known as astigmatism, have a

similar history of usage: hard lenses from the early 1950's and soft from the first half of the 1970's. Toric lenses differ from standard contact lenses in having a prism base, *i.e.,* one edge portion of the lens is thicker. Proper prescription and fitting of toric lenses on the cornea of the eye requires alignment of a central lens axis with this prism base. Markings on the contact lens surface greatly facilitate the fitting process.

Inks and other substances have been used since the early 1950's, however, those marking procedures suffer several disadvantages: difficulty of accurate application with possible FDA disapproval; possibility of dissolution, blurring, and allergic reactions. Mechanical marking, as with a sharp scribing tool or an abrading tool such as a dental bur, is also available, but not without its problems: inaccurate and inconsistent positioning of the mark, lens damage, inadequate visibility, and the expense and time involved.

2. *The Patent*

The '814 patent, entitled Transparent Ophthalmic Lens having Engraved Surface Indicia, discloses an engraved contact lens and provides a method of engraving using a source of high intensity electro-magnetic energy, such as a laser. The mark, not as deep as the lens is thick, is surrounded by a smooth surface of unsublimated or unaffected polymer material with the result that edges of the markings do not inflame or irritate the eyelid of the lens wearer.

The claims in suit are 1, 2, and 7. Claim 1 provides:

> An ophthalmic lens adapted to be placed in direct contact with eye tissue formed of a transparent cross-linked polymer material, said lens being characterized by identifying indicia engraved in a surface thereof by subjecting said lens to a beam of radiation emerging from a laser having an intensity and wavelength at least sufficient to sublimate said polymer and form depressions in said lens surface to a depth less than the thickness of said lens, said lens having a smooth surface of unsublimated polymer material surrounding said depressions, and by varying in a predetermined manner the point at which said laser beam impinges upon said lens surfaces to engrave said identifying indicia in said lens surface.

Claim 2 depends from claim 1 with the limitation that the lens is formed by a cross-linked hydrophilic (water loving) polymer. Claim 7, a product claim, is similar to claim 1 but defines the depressions as relieved zones.

3. *The Dispute*

In February 1976, Mr. Donald Hager, then production manager at the Milton Roy Company, a manufacturer of soft contact lenses which was purchased by appellant Bausch & Lomb in 1979, sent to Carco, Inc., a distributor of laser equipment, six soft contact lenses for laser marking. At least two lenses were successfully marked. Around September 1976, Dr. David Fisher and Mr. James A. McCandless, also of Milton Roy Company, met with Mr. Hager to debrief him on the work. Soon thereafter, Mr. Hager resigned.

Dr. Fisher and Mr. McCandless continued to work on the lens-marking system, and in November 1977 filed an application for the patent in suit, listing themselves and Mr. Hager as inventors. Mr. Hager declined to execute the patent application, being at that time the employee of another lens manufacturing company, Sauflon International, Inc. and saying that he had not "invented anything in connection with laser marking of contact lens." He further said that he could not execute documents, under oath or otherwise, that represent the contrary. The patent and Trademark Office (PTO) initially, and on a second occasion, rejected all the claims as obvious over two prior art U.S. patents to Brucker (No. 3,833,786) (teaching the use of a laser to fenestrate, i.e., make holes, in contact lens to allow circulation of fluid through the lens) and to Caddell (No. 3,549,733) (disclosing the use of a laser to remove plastic from the surface of a printing plate to form a pattern). The PTO later issued the patent in 1980 as limited to a transparent cross-linked polymer having a smooth surface around the mark. Mr. Hager

did sign as inventor in 1982. Meanwhile, Milton Roy commenced manufacture and marketing of laser-marked soft contact lenses in 1978.

Barnes-Hind's predecessor, Continuous Curve, Inc., introduced under the trademark HYDROCURVE a line of soft toric lenses around 1975-76 that were marked with an indentation by a bur. In 1981, Barnes-Hind offered a soft toric lens marked by a laser.

Bausch & Lomb filed suit, contending that certain laser-marked contact lenses manufactured and sold by Barnes-Hind infringe claims 1, 2, and 7 of the '814 patent. Barnes-Hind denied infringement and counterclaimed that the patent was invalid, void, and unenforceable. The parties narrowed the issue of infringement to whether the marks on the HYDROCURVE lenses are surrounded by a smooth surface of unsublimated polymer material with respect to claims 1 and 2 or a smooth and unaffected surface for claim 7.

4. *The District Court Proceedings*

The district court determined that Barnes-Hind "proved by clear and convincing evidence that the patent in suit (4,194,814) and each of its claims is invalid and therefore void." It concluded that the differences between the claims and the prior art would have been obvious, finding that "the fact that the claimed subject matter of the patent in suit was obvious to Mr. Hager is most indicative of the obviousness of the invention," and that "Dr. Brucker's experiments in laser marking contact lenses are further evidence in support of this court's finding of obviousness." The court further concluded that scanning electron microscope (SEM) photographs, showing "that the surface of these lenses surrounding the laser mark are not 'smooth and unsublimated' or 'unaffected' as those terms were defined by plaintiff [appellant] during the processing of the patent in suit," demonstrated lack of infringement in any case. Bausch & Lomb appealed.

Opinion

The judgment is premised on several legal errors: (1) disregard of the presumption of validity established by 35 U.S.C. § 282; (2) absence of the factual findings on the four inquiries mandated by *Graham v. John Deere Co.,* 383 U.S. 1, 17, 148 USPQ 459, 467 (1966); and (3) improper claim construction leading to the conclusion of noninfringement. We vacate the court's opinion and remand for a determination consistent with this opinion.

1. *Presumption of Validity*

A patent shall be presumed valid, and each claim shall be presumed valid independently of the validity of other claims. 35 U.S.C. § 282. The burden is on the party asserting invalidity to prove it with facts supported by clear and convincing evidence. *Loctite Corp. v. Ultraseal Ltd.,* 781 F.2d 861, 872, 228 USPQ 90, 97 (Fed. Cir. 1985); *Jones v. Hardy,* 727 F.2d 1524, 220 USPQ 1021 (Fed. Cir. 1984).

The record contains no reference to this statutory presumption of validity, nor does it appear that the district court considered separately the validity of the three claims at issue. By merely holding that "defendants have proved by clear and convincing evidence that the patent in suit (4,194,814) and each of its claims is invalid and therefore void," the district court improperly denied the '814 patent its statutory presumption of validity as to each claim.

The district court thought the examiner had been misled. Barnes-Hind argued and argues here that Bausch & Lomb (or rather its later acquired company Milton Roy) misled the examiner during prosecution. Appellees assert that "if the examiner had been correctly and forthrightly informed of Hager's and McCandless' opinions, the chemistry of the Brucker lens, and the teaching of the Caddell patent, he would not have issued the patent." The record, however, does not support this assertion.

The examiner did know of Hager's temporary refusal to execute the application during prosecution and, as discussed more fully *infra,* a determination of nonobviousness is based, *inter alia,* on the opinion of a hypothetical person of ordinary skill in the art, not on the inventors' opinion. The weight to be attached to Hager's refusal cannot be exaggerated as the court below has done without clear error in view of Hager's self interest as an employee of a competitor and his later change of position. Instances of inventors refusing even to cooperate in obtaining issuance of a patent to be owned by an assignee are common and machinery is provided in 37 C.F.R. § 1.47 to deal with them. Section 1.47 provides that either a joint inventor or a proper assignee may file the

application without the consent or signature of the inventor, just so the oath or declaration is accompanied by a petition including proof of pertinent facts. It is clear, therefore, that the PTO does not allow the inventor to erect that type of obstacle to obtaining patent protection. Such forethought is necessary, as otherwise an inventor's changed self interest might nullify a proper assignment. The district court's heavy reliance on Mr. Hager's assertions, if persisted in, would allow a co-inventor another chance at sabotage if the first effort has failed.

Finally, the examiner, who with the deference we owe governmental officials we assume has some expertise in interpreting the refer

ences and some familiarity with the level of skill in the art, *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1359, 220 USPQ 763, 770 (Fed. Cir.), *cert. denied,* ___ U.S. ___, 105 S.Ct. 95, 224 USPQ 520 (1984), did have the Brucker and Caddell patents before him. Barnes-Hind's "misleading the examiner" contention is insufficiently supported to overcome the presumption of validity.

As a final matter, we recognize, as the district court did not, that when the prior art before the court is the same as that before the PTO, the burden on the party asserting invalidity is more difficult to meet. *American Hoist,* 725 F.2d at 1359, 220 USPQ at 770.

2. *Graham Findings*

Obviousness under 35 U.S.C. § 103 is a question of law based on the underlying factual inquiries set forth in *Graham v. John Deere Co.,* 383 U.S. 1, 17, 148 USPQ 459, 467 (1966): (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; (3) the level of ordinary skill in the art; and (4) objective evidence of secondary considerations. *See, e.g., Loctite,* 781 F.2d at 872, 228 USPQ at 97-98.

The *Loctite* court further stated:

> In patent cases, the need for express *Graham* findings takes on an especially significant role because of an occasional tendency of district courts to depart from the Graham test, and from the statutory standard of obviousness that it helps determine, to the tempting but forbidden zone of hindsight. Thus we must be convinced from the opinion that the district court actually applied *Graham* and must be presented with enough express and necessarily implied findings to know the basis of the trial court's opinion.

Id, 228 USPQ at 98.

Here, as in *Loctite* and in *Jones,* we are not convinced that the district court applied the *Graham* findings. Instead, it found Mr. Hager's opinion that the subject matter was obvious "most indicative of the obviousness of the invention." This was legal error.

Unlike the district court, we have the benefit of the very clear exposition of the law in *Standard Oil Co. v. American Cyanamid Co.,* 774 F.2d 448, 454, 227 USPQ 293, 297-98 (Fed. Cir. 1985):

> The issue of obviousness is determined entirely with reference to a *hypothetical* "person having ordinary skill in the art." It is only that hypothetical person who is presumed to be aware of all the pertinent art. The actual inventor's skill is irrelevant to this inquiry, and this is for a very important reason. The statutory emphasis is on a person of *ordinary* skill. Inventors, as a class, according to the concepts underlying the Constitution and the statutes that have created the patent system, possess something -- call it what you will -- which sets them apart from the workers of *ordinary* skill, and one should not go about determining obviousness under § 103 by inquiring into what *patentees* (i.e., inventors) would have known or would likely have done, faced with the revelation of references. [Emphasis in original.]

[1] In this regard then, the district court erred at least three times: it relied too heavily on the alleged opinion of one who was an inventor and patentee, and misused that opinion as a substitute for determining the level of skill of the hypothetical person of ordinary skill and what that person would have been able to do when in possession of the prior art, the scope and contents of which the court should also have determined.

The court also engaged in improper hindsight analysis to conclude the '814 patent would have been obvious. The court essentially adopted Barnes-Hind's argument that "the concept of forming ridgeless depressions having smooth rounded edges using a laser beam to vaporize the material is explicitly disclosed in the Caddell patent. *This is exactly the same process claimed in the patent-in-suit and practiced by the plaintiff."*

Barnes-Hind selected a single line out of the Caddell specification to support the above assertion: "one way in which this [forming ridgeless depressions] can be achieved is to use a laser with high enough intensity to vaporize the plate material without melting it." Col. 5, lines 53-54. This statement, however, was improperly taken out of context. As the former Court of Customs and Patent Appeals held:

> It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one skilled in the art.

In re Wesslau, 353 F.2d 238, 241, 147 USPQ 391, 393 (CCPA 1965); *see also In re Mercer,* 515 F.2d 1161, 1165-66, 185 USPQ 774, 778 (CCPA 1975).

A full appreciation of Caddell's statement requires consideration of the immediately following sentences in the same paragraph and the paragraph after that. Viewed in that context, it is apparent that Caddell's ideal printing plate would have no ridges around the depression. The use of a high intensity laser is offered as a possible means to achieve the goal but is limited by several disadvantages. To overcome these disadvantages, Caddell suggests the use of a special class of polymer that forms ridgeless depressions. A complete read

ing demonstrates quite clearly that Caddell is setting up a strawman and pointing out its disadvantages to highlight the advantages of Caddell's invention, that special class of polymers. The district court improperly viewed an isolated line in Caddell in light of the teaching of the '814 patent to hold for obviousness. This is improper hindsight analysis.

The district court also failed to consider the Caddell reference in its entirety and thereby ignored those portions of the reference that argued against obviousness. *W. L. Gore & Associates, Inc. v. Garlock, Inc.,* 721 F.2d 1540, 1550, 220 USPQ 303, 311 (Fed. Cir. 1983), *cert. denied,* ___ U.S. ___, 105 S. Ct. 172 (1984). Caddell compared the ridge formation of his special class of polymers against, *inter alia,* Lucite, a copolymer composed of ethyl acrylate with methylmethacrylate -- very similar to the chemical referred to in the '814 patent -- and found that *only* his special class formed depressions without ridges. Thus, Caddell actually taught away from laser etching of soft contact lenses.

As further evidence of obviousness, the district court relied on Dr. Brucker's experiments in laser marking contact lenses. This too was error, in this case clearly erroneous factual error. The record does not support, indeed it contradicts, the supposition that Dr. Brucker had engaged in laser marking of soft contact lenses at the time of the present invention. On page 385 of the Appendix, in reply to Mr. Calimafde's question "when did Continuous Curve begin to experiment with laser marking of soft contact lenses?", Dr. Brucker replied "I believe it was in '79 -- '79, '80, somewhere in that area." The filing date of the '814 patent was November 10, 1977. Brucker's 3,833,786 patent for a method of fenestrating (putting windows in) contact lenses applies according to its claims to such lenses, both soft and hard. However, the record reflects that the need for such fenestration was as a mode of escape for fluid accumulating between the lens and the eye. Such a need does not exist respecting the soft lenses, the principal subject of the claims in suit, of which claim 2 is expressly limited to soft lenses. They, being hydrophilic, absorb the fluid.

In sum, the district court improperly determined the '814 patent was obvious: it failed to make the Graham inquiries, it improperly focused on what was obvious to the inventor, it engaged in hindsight analysis, and it considered evidence that was not prior art. This court, as an appellate court, may not make the required Graham

factual findings, and must therefore remand that determination to the district court. The district court should not ignore the four-part analysis the authorities require.

a. *The scope and content of prior art*

To determine whether a reference is within the scope and content of the prior art, first determine if the reference is within the field of the inventor's endeavor. If it is not, then next consider whether the reference is reasonably pertinent to the particular problem with which the inventor was involved. *In re Richard M. Deminski,* 230 USPQ 313, 315, No. 85-2267, slip op. at 9 (Fed. Cir. July 8, 1986); *Stratoflex, Inc. v. Aeroquip Corp.,* 713 F.2d 1530, 1535, 218 USPQ 871, 876 (Fed. Cir. 1983). *Orthopedic Equipment Co., Inc. v. United States,* 702 F.2d 1005, 1008-11, 217 USPQ 193, 196-97 (Fed. Cir. 1983) focused on the claims in suit, the art the PTO applied to the claims, and the nature of the problem confronting the inventor. Further, the art must have existed as of the date of invention, presumed to be the filing date of the application until an earlier date is proved.

b. *The differences between the claimed invention and the prior art*

The court must view the claimed invention *as a whole. See, e.g., Jones,* 727 F.2d at 1527-28, 220 USPQ at 1024. We add, as a cautionary note, that the district court appeared to distill the invention down to a "gist" or "core," a superficial mode of analysis that disregards elements of the whole. It disregarded express claim limitations that the product be an ophthalmic lens formed of a transparent, cross-linked polymer and that the laser marks be surrounded by a smooth surface of unsublimated polymer. *See also, ACS Hospital Systems, Inc. v. Montefiore Hospital,* 732 F.2d 1572, 221 USPQ 929 (Fed. Cir. 1984).

c. *Level of ordinary skill in the art*

In *Environmental Designs, Ltd. v. Union Oil Co.,* 713 F.2d 693, 697, 218 USPQ 865, 868-69 (Fed. Cir. 1983), *cert. denied,* 464 U.S. 1043 (1984), the court listed six factors relevant to a determination of the level of ordinary skill: educational level of the inventor, type of problems encountered in the art, prior art solutions, rapidity of innovation, sophistication of technology, and educational level of active workers in the field. As to educational level of the inventor, *see Standard Oil Co. v. American Cyanamid Co.,* 774 F.2d 448, 227 USPQ 293 (Fed. Cir. 1985); *Orthopedic Equipment Co. v. All Orthopedic Appliances,* 707 F.2d 1376, 1382, 217 USPQ 1281, 1285 (Fed. Cir. 1983) ("Although the educational level of the inventor may be a factor in determining the level of ordinary skill in the art, it is by no means conclusive.")

d. *Objective indicia of obviousness*

Such "secondary considerations," when present, must always be considered. Stratoflex, 713 F.2d at 1538, 218 USPQ at 878-79. *See also Cable Electric Products, Inc. v. Genmark,*

Inc., 770 F.2d 1015, 1026-28, 226 USPQ 881, 887-88 (Fed. Cir. 1985). Such evidence includes commercial success, long felt but unresolved needs, and failed attempts. *Perkin-Elmer Corp. v. Computervision Corp.,* 732 F.2d 888, 895-96, 221 USPQ 669, 675 (Fed. Cir.), *cert. denied,* ___ U.S. ___, 105 S.Ct. 187, 225 USPQ 792 (1984).

We shall vacate the trial court's opinion and remand for an obviousness determination consistent with this opinion.

3. *Infringement*

The parties narrowed the infringement issue for trial to the question whether the surface of Barnes-Hind lenses surrounding the laser mark is "smooth and unsublimated" or "unaffected." The district court concluded that "the laser-engraved depressions in the surface of the HYDROCURVE II lenses have been examined by scanning electron microscope. These photographs show that the surface of these lenses surrounding the laser mark are not 'smooth and unsublimated' or 'unaffected' as those terms were defined by plaintiff during the prosecution of the

patent in suit." Appellant Bausch & Lomb argues on appeal that the trial court's approach of assessing smoothness at the very high levels of magnification obtainable by a SEM exceeds the level of smoothness required in the claims. We agree.

Because the first step in determining infringement is claim construction, improper claim construction can distort the entire infringement analysis. *Moeller v. Lonetics, Inc.,* 229 USPQ 992, 994, No. 85-2646, slip op. at 7 (Fed. Cir. June 4, 1985). Such a distortion occurred below.

Disputed issues such as the meaning of the term "smooth," should be construed by resort to extrinsic evidence such as the specification, other claims, and the prosecution history. Here, resort to the specification clearly demonstrates that "smooth" meant that "the edges of the craters neither inflame nor irritate the eyelid of the lens wearer * * *. The markings provided on the lens surface in accordance with this invention * * * are not perceived by the lens wearer * * *." The prosecution history supports this construction. A reading of the amendment and its accompanying remarks demonstrates that smooth means the absence of a ridge that "would scratch either the eye or eyelid and would lead to infection." There is no indication that smooth means absolutely ridge-free. (This review of the prosecution history also leads us to disagree with Barnes-Hind's final argument that the prosecution history estops Bausch & Lomb from asserting infringement against the allegedly ridged HYDROCURVE lens.) Testimony from Dr. Mandell, Bausch & Lomb's expert in the field of contact lenses, indicates that to a person of ordinary skill in the art, smooth would mean an absence of "roughness or significant elevation" so that a wearer "would not feel it with the [eye]lid." Further, there is testimony that a person of ordinary skill in the art would use an optical microscope, not an SEM, to gauge the relative smoothness of an etched contact lens.

[2] We hold that smooth means smooth enough to serve the inventor's purposes, *i.e.,* not to inflame or irritate the eyelid of the wearer or be perceived by him at all when in place. Accordingly, we vacate the district court's conclusion that the surface of the HYDROCURVE lenses are not smooth or unaffected, and remand for a determination of infringement based on the proper construction of and proper test for smooth.

Conclusion

We vacate the district court's determination that the '814 patent is invalid and remand for a reconsideration of validity in light of the presumption of validity and the *Graham* findings on obviousness. We further vacate the decision of noninfringement and remand for proper claim construction and infringement analysis.

VACATED AND REMANDED

- End of Case -

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FULL TEXT OF CASES (USPQ FIRST SERIES)

In re Mercier

(CCPA)
185 USPQ 774
Decided May 15, 1975
No. 74-528
U.S. Court of Customs and Patent Appeals

Headnotes

PATENTS

1. Patentability — Anticipation — Modifying references (§ 51.217)
All relevant teachings of cited references must be considered in determining what they fairly teach to one having ordinary skill in art.

2. Patentability — Evidence of — Suggestions of prior art (§ 51.469)
Relevant portions of reference include not only teachings that would suggest particular aspects of invention to one having ordinary skill in art, but also teachings that would lead away from claimed invention.

3. Court of Customs and Patent Appeals—Issues determined—Ex parte patent cases (§ 28.203)
Statement in applicant's reply brief that distinction between materials lay in fact that one group was subject to side reactions while other was not, is sufficient basis in record presented to Board of Appeals to merit Court of Customs and Patent Appeals' consideration of differences in material of prior art reference and application.

4. Patentability — Invention — Specific cases — Chemical (§ 51.5093)

Patentability — Substitution of equivalents (§ 51.65)
Mere known relationship between classes of compounds as disclosed by isolated portion of prior art reference is insufficient to support section 103 rejection; as distinguished from disclosure of equivalents, disclosure of known relationship does no more than teach that it would have been obvious to try, which is insufficient under section 103; mere relationship is insufficient basis for necessary predictability of success to sustain section 103 rejection.

5. Patentability — Invention — Specific cases — Chemical (§ 51.5093)

Conclusion that applicant's invention would have been nonobvious to one having ordinary skill in art is buttressed by fact that claimed invention is catalytic process.

6. Patentability — Invention — Specific cases — Chemical (§ 51.5093)

Patentability — Substitution of equivalents (§ 51.65)

Fact that processing details of claimed invention are substantially identical to those of reference lends nothing to section 103 rejection absent showing that it was obvious to substitute compounds of application for compounds of reference.

7. Patentability — Invention — Specific cases — Chemical (§ 51.5093)

Patentability — Substitution of equivalents (§ 51.65)

Adequacy of showing of chemical equivalency must be scrutinized especially carefully where it is alleged to have been obvious to substitute one starting material for another in catalytic process.

8. Construction of specification and claims — Claim defines invention (§ 22.30)

If one can determine whether process is within scope of claim, claim fulfills its purpose as definition.

9. Claims — Indefinite — In general (§ 20.551)

Whether term used in claim is conventional is not necessarily controlling on question of indefiniteness.

Particular patents — Splitting acetals

Mercier, Process for Splitting Acetals and Hemi-acetals, rejection of all claims, reversed.

Case History and Disposition:

Appeal from Board of Appeals of the Patent and Trademark Office.

Application for patent of Jules Mercier, Serial No. 708,775, filed Feb. 28, 1968. From decision rejecting all claims, applicant appeals, Reversed; Markey, Ch. J., dissenting with opinion.

Attorneys:

Keith V. Rockey, Chicago, Ill. (DavidR. Murphy, Arlington, Va., of counsel), for appellant.

Joseph F. Nakamura and Jack E. Armore for Commissioner of Patents and Trademarks.

Judge:

Before Markey, Chief Judge, and Rich, Baldwin, Lane, and Miller, Associate Judges.

Opinion Text

Opinion By:

Baldwin, Judge.

This appeal is from the decision of the Patent and Trademark Office Board of Appeals affirming the examiner's rejection of all claims remaining in application serial No. 708,775, filed February 28, 1968, entitled "Process for Splitting Acetals and Hemi-Acetals." We reverse.

The Invention

Appellant's invention relates to a process for "splitting" acetals and hemi-acetals by either hydrolysis or alcoholysis reactions. The alcoholysis of acetals or hemi-acetals by means of alcohols results in the formation of acetals having alcohol radicals different from those on the original material. The hydrolysis reaction of acetals or hemi-acetals with water results in the formation of the corresponding aldehydes.

Appellant's specification describes the reactions of the invention as follows:

> These reactions can be illustrated by the following equations in which R, R' and R" can be organic radicals which are the same or different hydrocarbon radicals which may be straight or branched-chain alkyl radicals having from 1 to 12 carbon atoms, such as methyl, ethyl, propyl, isopropyl, butyl, isobutyl, amyl, isoamyl, hexyl, 2-ethyl butyl, heptyl, octyl, isooctyl, 2-ethyl hexyl, nonyl, isononyl, decyl and dodecyl; alkenyl radicals having from 3 to 12 atoms, such as propenyl, butenyl, hexenyl and allyl, the olefinic linkage of the alkenyl radicals being not in a, b; alicyclic radicals, such as cyclohexyl and methyl cyclohexyl; and aralkyl radicals, such as benzyl. R can also be hydrogen or an aromatic radical, such as phenyl, tolyl and xylyl, the aromatic radical having only one nucleus, the nucleus bearing no more than two alkyl substituents, and the total amount of carbon atoms of the alkyl substituents, if any, being from 1 to 5.
>
> Hydrolysis:
>
> R-CH(OR¢) $_2$+ H $_2$O R-CHO + 2 □ R¢OH
>
> Alcoholysis:
>
> R-CH(OR¢) $_2$+ 2 R¢¢OH □ R-CH-(OR¢¢) $_2$+ 2 R¢OH

The prior art processes for accomplishing the above-referred to reactions are apparently subject to some difficulties. For example, the removal of one or both of the OR¢ groups on the acetal may have a tendency to cause polymerization into what the specification refers to as "complex compounds of varying and not accurately defined polymerization degree." The removal of an OR¢ group apparently can also lead to the formation of undesired highly volatile and explosive ethers. Additionally, use in many of the prior art processes of a strong inorganic acid such as sulfuric acid to catalyze the splitting reaction causes corrosion problems and provides a product which is difficult to separate from the catalyst.

Appellant's process for "splitting" acetals and hemi-acetals is accomplished by passing a homogeneous liquid phase containing the reactant upwardly through a bed of suspended catalyst particles in the form of a sulfonic ion-exchange resin in the acid form.

The specification sets forth the processing details by which the process may be carried out as follows:

> Continuous operation may, for example, be performed by passing the liquid reactants heated to reaction temperature through a reaction zone containing a catalyst and maintained under the pressure required for maintaining the reaction medium or mixture in a liquid state at the operating temperature. One may advantageously employ, inter alia, an inverted cone-shaped reactor through which the reaction medium or mixture flows in an upward direction *thereby to maintain the finely divided catalyst in a dispersed or suspended state or in a fluidized state through the liquid phase.* [Emphasis added.]

The language of the claims defines the invention in much the same manner as the specification, except that the sulfonic ion exchange catalyst is referred to as a "fluidized catalyst" instead of a catalyst in a "dispersed or suspended state or in a fluidized state through the liquid phase." Claim 16 is representative:

> 16. A process for splitting acetals and hemi-acetals which comprises passing a homogeneous liquid reaction mixture comprising a compound selected from the group consisting of an acetal having the formula:
>
> R - CH (OR¢) 2
>
> and a hemiacetal having the formula:
>
> R - CH(OH)(OR¢)
>
> wherein R is selected from the group consisting of hydrogen and a hydrocarbon group containing 1-12 carbon atoms and R¢ is a hydrocarbon group containing 1-12 carbon atoms and a material selected from the group consisting of water and a mixture of alkanol and water, wherein the water constitutes between 5-30% by weight of the reaction mixture, upwardly through a fluidized catalyst, said catalyst being a sulfonic ion exchange resin in acid form, at a temperature of 60° to 140° C. and a pressure sufficient to maintain the reaction mixture in the liquid phase.

The Prior Art Rejection

The following references were relied on:

Table set at this point is not available. See table in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.

The board cited the following as "[g]eneral references of which we take judicial notice":

> Webster's Third New International Dictionary, Unabridged, p. 877 (1963).
>
> Kirk-Othmer, Encyclopedia of Chemical Technology, Second Edition, Vol. 9, pp. 398, 399 (1966).
>
> The Condensed Chemical Dictionary, 7th Ed., p. 423 (1966).
>
> Hackh's Chemical Dictionary, 4th Ed., p. 273 (1969).

> Perry's Chemical Engineers' Handbook, 4th Ed., § 20, pp. 42-52, particularly p. 50 (1963).

The appealed claims were rejected by the examiner over Enk in view of Alheritiere under the provisions of 35 USC 103. Enk teaches a process for the hydrolysis of alkanol derivatives, such as acetals, by means of water in the presence of a static acid exchange catalyst. His specification states:

> It is known to crack hydrolyzable organic oxygen compounds such as, for example, esters, acetals or ketals, in the presence of acid catalysts, like mineral acids or cation exchangers, with water, into alcohol and the appropriate organic residue. In all cases the reaction can be carried out only up to the hydrolysis equilibrium. The hydrolysate in equilibrium, consisting of the starting substance, water, alcohol and a second cracking product which, depending upon the starting substance, is an acid, an aldehyde or a ketone, is then separated into its components.

Alheritiere discloses a process in which a solid catalyst is suspended in an upwardly flowing liquid reaction mixture. The catalyst is thus suspended in a turbulent state in the liquid permitting more efficient mass and heat transfer rates and facilitating reactions involving heterogeneous liquid mixtures. Alheritiere teaches generally that hydrolysis reactions using an ion exchange resin catalyst may be advantageously accomplished by means of his process, but he nowhere specifically discloses the hydrolysis of either acetals or hemi-acetals.

The board agreed with appellant that it was improper for the examiner to combine the two references, "with respect to the inventive contribution of Enk et al.," but upheld the rejection insofar as it was based on "the teachings of Enk et al. as to what was previously known in the art." The board stated:

> In view of the teachings in Enk et al. as to the relationship between esters and acetals in hydrolysis by means of cation exchange resins it would clearly be obvious to one skilled in this art to substitute an acetal for the methyl acetate or other esters in Alheritiere et al., thus to anticipate appellant's claimed contribution. The Examiner's rejection will therefore be sustained.

Other Rejections

The appealed claims were further rejected by the examiner as failing to comply with the second paragraph of 35 USC 112, "as being indefinite in the recitation 'a fluidized catalyst' in claim 16, on which all the other claims depend directly or indirectly." The examiner stated:

> In a true fluidized system, a gas is passed upwards through a mass of granular or powdered solid, so that particles are "floated" and the mass resembles a boiling liquid in appearance. See In re Edwards [43 CCPA 884, 232 F.2d 641, 109 USPQ 380 (1956)], 1956 C.D. 264. The term "fluidized" is not appropriate to a system wherein the solids are suspended in a liquid medium.

Sustaining the rejection, the board commented:

> The teaching in page 3 of the specification of the catalyst in a dispersed suspended or fluidized state throughout the liquid phase is not the above-cited terminology now incorporated in the claims by an amendment. While the dictionary cited by appellant appears to include a moving liquid to suspend solids to produce a fluidized catalyst it might appear that such a liquid in boiling condition may be intended since the more general definition of a fluidized catalyst is limited to finely divided solid catalysts suspended in a moving gas in such manner that the entire mass acts like a fluid. Webster's and Hackh's Dictionaries, above-cited, as well as Kirk-Othmer's Encyclopedia and Perry's Handbook demonstrate the widespread acceptance of a gas or vapor as the suspending agent. Further as the Examiner has indicated in the decision cited by appellant, In re Edwards, 1956 C.D. 264, the references therein discussed also indicate the term "fluidized catalyst" to be known as applied to gas-suspended solid catalyst particles.

Furthermore, since the term "fluidized catalyst" was added to the claims by amendment, the board sustained the rejection of the claims as lacking antecedent basis in the specification and thus introducing new matter prohibited by 35 USC 132 and Rule 75(d), 37 CFR 1.75(d).

The board went on to find an additional basis for the examiner's rejection of the claims based on the first paragraph of section 112:

> [S]ince it is quite apparent that the criticized term encompasses gas suspension of the catalyst which would not appear to be operative in the claimed process, the terminology not only violates 35 U.S.C. 112, second paragraph, in delineating more than that which appellant

> considers to be his invention but also fails to find enabling support in the disclosure (paragraph one of this section of the statute). The Examiner's rejection will therefore be sustained.

Opinion

The Prior Art Rejection

[1] Whether appellant's invention is obvious under 35 USC 103 depends at the outset upon the propriety of the board's simultaneous reliance on what Enk says is known in the art and disregard of the rest of Enk's disclosures. We find several difficulties with this analysis. The general statement in Enk that one having ordinary skill in this art is aware that acetals may be cracked with water in the presence of an acid catalyst, "like mineral acids or cation exchangers," lacks any teaching of how the process is accomplished by prior art techniques. What temperatures would be required for the reaction? What was the physical state of the catalyst? Will the reaction proceed in a homogeneous liquid phase, or in a gaseous phase or only in a multi-phase system? These and other questions arise because the board's approach fails to recognize that *all* of the relevant teachings of the cited references must be considered in determining what they fairly teach to one having ordinary skill in the art. In re Meinhardt, 55 CCPA 1000, 1004, 392 F.2d 273, 276, 157 USPQ 270, 272 (1968). See also In re Halley, 49 CCPA 793, 296 F.2d 774, 132 USPQ 16 (1961); In re Van Mater, 52 CCPA 1076, 341 F.2d 117, 144 USPQ 421 (1965).

[2] The relevant portions of a reference include not only those teachings which would suggest particular aspects of an invention to one having ordinary skill in the art, but also those teachings which would lead such a person away from the claimed invention. See In re Lunsford, 53 CCPA 986, 357 F.2d 380, 148 USPQ 716 (1966).

The board's approach amounts, in substance, to nothing more than a hindsight "reconstruction" of the claimed invention by relying on isolated teachings of the prior art without considering the over-all context within which those teachings are presented. Without the benefit of appellant's disclosure, a person having ordinary skill in the art would not know what portions of the disclosure of the reference to consider and what portions to disregard as irrelevant, or misleading. See In re Wesslau, 53 CCPA 746, 353 F.2d 238, 147 USPQ 391 (1965).

Enk's specification was relied upon by the board to show that organic hydrolyzable oxygen-containing compounds, including esters and acetals, may be cracked "in the presence of acid catalysts, like mineral acids or cation exchangers with water into alcohol and the appropriate organic residue." This disclosure is relevant to the obviousness inquiry, since appellant claims, inter alia a process for the hydrolysis of acetals and hemi-acetals in the presence of water and a sulfonic ion-exchange resin catalyst in the acid form. There is, however, additional relevant knowledge made available by the disclosure of Enk within the context of which the isolated teaching ought properly to be considered.

Again referring to the prior art, Enk teaches:

> In all cases the reaction can be carried out only up to the hydrolysis equilibrium. The hydrolysate in equilibrium, consisting of the starting substance, water, alcohol and a second cracking product which, depending upon the starting substance, is an acid, an aldehyde or a ketone, is then separated into its components.
>
> Since due to the *unfavorable hydrolysis equilibrium,* which for instance under stoichiometric conditions for methyl acetate means only about 30% conversion — a comparatively large quantity of methyl acetate is present in the hydrolysate which with methanol form an azeotropic mixture in the proportion of about 4:1, the larger part of the methanol can be obtained only in the form of the azeotropic mixture from which it must be separated for instance by extractive distillation * * *. [Emphasis added.]

Enk discloses a process for avoiding this deleterious equilibrium condition which by:

> removing both reaction products and retaining the starting substance (the hydrolyte) in the reaction chamber, permits the shift of the equilibrium in the direction of complete hydrolysis and thus make possible an almost 100% transformation without circulation of the starting substrate and without forming an azeotropic mixture, with a single pass. The process is characterized by the fact that the water-containing liquid phase flowing downward in the ion exchanger bed and perhaps containing the second cracking product is used for the extraction of the obtained alkanol, and the starting substance is kept in the rising vapor phase until the transformation is complete.

Enk thus warns that the equilibrium condition for the reaction is to be avoided, and that this may be accomplished by carrying

out the hydrolysis reaction in a heterogeneous phase system in order to continuously remove the reaction products while maintaining the starting material in the vapor phase in the reaction vessel. The patent states:

> The ion exchanger column 1 is kept, by external heating and, if desired, by adding the reaction partners in vapor form, at a temperature sufficient to hold part of the reaction mixture, i.e., particularly the starting substance, in vapor form, without any significant recirculation existing in the reflux condenser 3.

Because the only other reference before the board, Alheritiere, discloses only esters and makes no mention of acetals or hemi-acetals, Enk must be relied upon to show that acetals and hemi-acetals are, *in the context of the claimed invention, equivalent* to esters. Without such a showing, Alheritiere is irrelevant to the claims at issue, which are confined solely to acetals and hemi-acetals.

[3] In answer to the solicitor's contention that the difference in the reactivity of esters and acetals is a new argument not properly before this court, we direct the solicitor's attention to appellant's reply brief, filed December 7, 1972, where he argued:

> The Examiner takes the position [that Enk] equates the hydrolysis of esters and hydrolysis of acetals. However, the distinction between these materials which the Examiner overlooks is the fact that acetals are subject to deleterious side reactions such as ether formation and polymerization whereas esters are not.

This is a sufficient basis in the record presented to the board to merit our consideration of this issue in the present appeal.

[4] Our review of Enk's teachings convinces us that they fail to teach the equivalency between acetals and esters for the purposes of the present invention. A mere known *relationship* between acetals and esters as disclosed by the isolated portion of Enk upon which the board relied is insufficient to support the rejection. As distinguished from a disclosure of *equivalents,* the disclosure of a *known relationship* does nothing more than teach that it would have been *obvious to try,* which is insufficient under section 103. In re Lindell, 55 CCPA 707, 385 F.2d 453, 155 USPQ 521 (1967). Many compounds have a known relationship but are not equivalents for substitution in different reactions. A mere *relationship* is an insufficient basis for the necessary predictability of success to sustain a rejection under section 103. See In re Naylor, 54 CCPA 902, 369 F.2d 765, 152 USPQ 106 (1966).

Appellant argues that significant aspects of the claimed invention are dissimilar to Alheritiere's reaction because there are no side reactions possible for the ester, whereas side reactions are often a problem in acetal and hemi-acetal hydrolysis and are disclosed in appellant's specification. Hydrolysis of esters results in the formation of a carboxylic acid and an alcohol. The acetal hydrolysis reaction, as noted above, results in the formation of an *aldehyde* and an alcohol. Consistent with appellant's position, we note that aldehydes are generally recognized to be inherently reactive compounds in the presence of the acidic catalysts required for the hydrolysis and form polymerization products because the carbonyl bond in the aldehyde is subject to attack by hydrogen ions present in the solution. Carboxylic acids are, by contrast, generally stable in acidic solutions and will not normally engage in side reactions of the type noted for the aldehydes. Accordingly, Enk's statement cannot be given the broad sweep required to sustain the rejection and may in fact be disbelieved for the purposes of specific liquid phase acid catalyzed hydrolysis reactions.

Considering the alleged teaching of equivalency in the context of *all* the relevant teachings of the references, we conclude that it must fail insofar as the process of Alheritiere is concerned, because the reference that is relied upon for the teaching is presented in the context of a prior art process that is significantly dissimilar to that of the claimed invention.

Given that Enk's "inventive contribution" cannot be ignored, the board has in substance agreed with this conclusion by finding that it was improper for the examiner to combine the two references "with respect to the

inventive contribution of Enk et al."

[5] The conclusion that appellant's invention would have been nonobvious to one having ordinary skill in the art on the basis of the cited art is further buttressed by the fact that the claimed invention is a catalytic process. The unpredictability of catalytic phenomena has long been recognized by this court. As previously noted, Enk's disclosure is relied upon by the board for the proposition that organic oxygen-containing compounds, including acetals, may be hydrolyzed using the catalyst of appellant's invention. This does not render the process of appellant's invention any less unpredictable, because a successfully catalyzed process depends not only on the particular catalyst that may be employed but also on

the environment within which the catalysis is accomplished.

[6][7] The fact that the processing details of the claimed invention are substantially identical to those set forth in Alheritiere lends nothing to the rejection unless it can be shown that it would have been obvious to substitute acetals or hemi-acetals as reactants for the esters of Alheritiere. The adequacy of any such showing of equivalency must be scrutinized especially carefully, as we have attempted to do, where it is alleged to have been obvious to substitute one starting material for another in a *catalytic* process. The disclosure of Enk, relied upon by the board, is simply not sufficient for this purpose, especially in view of the over-all dissimilarity of the process of Enk to that of Alheritiere.

Other Rejections

We will follow the board's format and consider simultaneously the indefiniteness rejection based on the second paragraph of section 112, the alleged lack of antecedent basis for the claims in the specification required by Rule 75(d), 37 CFR 1.75(d), and the new matter rejection based on section 132, as well as an additional basis for the rejection found by the board based on the first paragraph of section 112. All of these rejections relate to appellant's use of the phrase "a fluidized catalyst" in claim 16, and each requires consideration of the same relevant portions of the specification.

The relevant portion of the second paragraph of section 112 has been construed to require only that the claims "set out and circumscribe a particular area with a reasonable degree of precision and particularity." In re Moore, 58 CCPA 1042, 1046, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (1971); In re Miller, 58 CCPA 1182, 1186, 441 F.2d 689, 692, 169 USPQ 597, 599 (1971). As this court has reiterated on several occasions, "[i]n the absence of evidence to the contrary, we will assume * * * that what the claims define is what the applicant *regards* as his invention." (Emphasis added.) In re Miller, supra; In re Moore, supra.

[8] Applying this analysis, if one can determine whether a particular catalytic process for splitting acetals and hemi-acetals is or is not within the scope of a claim, the claim fulfills its purpose as a definition. See In re Miller, supra. Referring to the term in claim 16 which has been objected to, namely "fluidized," we note that appellant does not simply provide that the reaction mixture is passed "upwardly through a fluidized catalyst," but he goes on to limit in some detail the physical and chemical characteristics of the catalyst and reaction mixture by concluding "said catalyst being a sulfonic ion exchange resin in acid form, at a temperature of 60° to 140°C. and a pressure sufficient to maintain the reaction mixture *in the liquid phase.* " (Emphasis added.)

[9] Assuming, *arguendo* that the phrase "fluidized catalyst" is more often than not used to refer to a gas-suspended catalyst system, it does not follow that confusion will result when the phrase is used in a claim to refer to a finely divided catalyst in a dispersed or suspended state in a liquid phase. Whether a term used in a claim is conventional is not necessarily controlling on the question of indefiniteness. See In re Castaing, 57 CCPA 1332, 429 F.2d 461, 166 USPQ 550 (1970).

Since we are unable to see why or how there would be uncertainty over the plain meaning of the claim read *in its entirety* in view of the quoted portion which provides that the reaction mixture is in a liquid phase, the section

112 second paragraph rejection must be reversed.

Referring to the requirements of the first paragraph of section 112, the board found that the phrase "fluidized catalyst" "encompasses gas suspension of the catalyst which would not appear to be operative in the claimed process" and so "fails to find enabling support in the disclosure." The board also found that, since the criticized phrase first appeared in nonoriginal claim 15, it represents new matter introduced into the disclosure of the invention which is prohibited by the last sentence in 35 USC 132, and there is no original antecedent basis therefor in the specification as required by Rule 75(d).

We have already determined that the relevant portions of appellant's claims call for a "homogeneous liquid reaction mixture" which is passed "upwardly through a fluidized catalyst." Because the claims require the catalyst to be suspended by an upwardly flowing liquid reaction mixture, gas suspensions of the catalyst are clearly not within the scope of the claims.

We, therefore, find that appellant has fully complied with the first paragraph of section 112, and that the addition of the objected to phrase by amendment to the claims does not constitute a violation of the requirement of either the new matter prohibition of section 132 or the antecedent basis provision of Patent Office Rule 75(d).

Accordingly, the decision of the board is *reversed.*

Dissenting Opinion Text

Dissent By:

Markey, Chief Judge, dissenting.

Appellant's sole contribution to the art is the proposal to use Alheritiere's process, apparatus and catalyst in the hydrolysis of acetals instead of esters. But Enk says that those skilled in the art had long known that acetals could be hydrolyzed in the presence of the same catalyst. Appellant does not deny, and nowhere attempts to disprove the *truth* of Enk's statement. Lack of explicit suggestion of the substitution is not fatal to a finding of obviousness. In re Lindell, 55 CCPA 707, 385 F.2d 453, 155 USPQ 521 (1967). The probative question is what Enk's disclosure means to those skilled in the art. In re Baranauckas, 55 CCPA 1204, 395 F.2d 805, 158 USPQ 24 (1968).

That Enk does not supply temperatures, pressures and the like is of no moment. Alheritiere supplies them.

The unpredictability of catalytic processes loses import here. Enk, Alheritiere and appellant all employ the same catalyst.

The alcohol formed in the hydrolysis of both esters and acetals is capable of side reaction. As recognized in appellant's specification, temperatures must be limited to avoid risk of such alcohol reaction.

Enk's invention is totally irrelevant. It does not in any manner refute or conflict with the statement of Enk concerning the knowledge and level of skill in the art. Nor does it suggest that acetals could not be hydrolyzed in Alheritiere's process and apparatus.

Finding no error in the board's upholding of the examiner's rejection under 35 USC 103, I would affirm its decision.

- End of Case -

that relates to the source of all such goods. What is wrong with the advertising evidence is that it fails to give any indication of the proportion of expenses allocated to promoting pink as an indication of source, a failure which can only result in guesswork by the court. Since Owens-Corning failed to carry its burden under the most minimal standard of proof it is difficult to understand how the Board imposed an improperly heavy burden.

The Board's evaluation of the evidence leading to its finding that Owens-Corning failed to establish that pink insulation is associated with a single source does not evoke a "definite and firm conviction that a mistake has been made." *United States v. United States Gypsum Co.*, 333 U.S. 364, 365, 68 S.Ct. 525, 92 L.Ed. 746 (1948). Accordingly, its finding cannot be regarded as clearly erroneous and must be affirmed.

INTERCONNECT PLANNING CORPORATION, Plaintiff-Appellant,

v.

Thomas E. FEIL, Robert O. Carpenter, V Band Systems, Inc., and Turret Equipment Corp.,* Defendants-Appellees.

Appeal Nos. 84-1467, 85-565.

United States Court of Appeals, Federal Circuit.

Oct. 9, 1985.

In a patent infringement suit, the United States District Court for the District of New York, 587 F.Supp. 1495, Kevin Thomas Duffy, J., granted summary judgment on defendants' counterclaim alleging that plaintiff's reissue patent no. 31,144 for a multistation telephone switching system was invalid, and plaintiff appealed. The Court of Appeals, Pauline Newman, Circuit Judge, held that defendant failed to establish by clear and convincing evidence that claims contained in reissue patent no. 31,144 for a multistation telephone switching system were invalid for obviousness.

Vacated and remanded.

1. Judgment ⇐650

For collateral estoppel to arise the prior decision need not have been final in the sense of 28 U.S.C.A. § 1291 pertaining to appealability of final orders but the prior adjudication must have been sufficiently firm to be accorded conclusive effect.

2. Patents ⇐327(1)

District court's decision on the invalidity of original patent claims, a decision not final, not certified, not appealed, and mooted by subsequent events, did not collaterally estop patent owner from appealing a ruling on the invalidity of claims of reissue patent.

3. Patents ⇐147

It was not correct to weigh reissue claims against original claims on issue of obviousness where the reissue claims were not substantially identical to the original claims. 35 U.S.C.A. § 103.

4. Patents ⇐147

When a patent has been reissued with claims that are not substantially identical to original claims, invention as a whole, as now claimed, must be evaluated in terms of obviousness. 35 U.S.C.A. § 103.

5. Patents ⇐314(5)

Obviousness vel non under 35 U.S.C.A. § 103 is a question of law, whose conclusion requires preliminary determination of several underlying factual issues relating to scope and content of the prior art, differences between prior art and claimed invention as a whole, level of ordinary skill in

* The complaint against Robert O. Carpenter and Turret Equipment Corp. was dismissed by stipulation, and they are not parties to this appeal.

the art at time invention was made, and so-called "secondary considerations" that reflect the contemporaneous response to the invention.

6. Patents ⇐16(3)

Those charged with determining compliance with 35 U.S.C.A. § 103 are required to place themselves in minds of those of ordinary skill in the relevant art at time invention was made, to determine whether that which is now plainly at hand would have been obvious at such earlier time; the invention must be viewed not with the blueprint drawn by inventor, but in the state of the art that existed at the time and must be evaluated not through eyes of the inventor, who may have been of exceptional skill, but as one of ordinary skill.

7. Patents ⇐112.1, 144

A duly issued patent is presumed valid, as is a duly reissued patent and burden of proving otherwise resides with person challenging its validity. 35 U.S.C.A. § 282.

8. Patents ⇐36(2), 112.1, 144

Examiner's decision, on an original or reissue application, is never binding on the court, however, it is evidence the court must consider in determining whether the party asserting invalidity has met its statutory burden by clear and convincing evidence.

9. Patents ⇐148

Upon reissue, burden of proving invalidity is made heavier; reissue patent reaches court clothed in a statutory presumption of validity and clear and convincing evidence is required to surmount that presumption.

10. Patents ⇐147

Trial court, in determining the validity of a reissue patent for a multistation telephone switching system, erred in reconstructing the system, using the blueprint of the patent owner's claims.

11. Patents ⇐16.29

District court erred in concluding as a matter of law that claim 1 of reissue patent no. 31,144 for a multistation telephone switching system was substantially identical, for purposes of determining obviousness, of its parent claim.

12. Patents ⇐16.1, 26(1)

Obviousness must be determined with respect to the invention as a whole and that is essential for combination inventions. 35 U.S.C.A. § 103.

13. Patents ⇐26(1)

When prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than hindsight gleaned from the invention itself; there must be something in the prior art as a whole to suggest desirability, and thus the obviousness, of making the combination. 35 U.S.C.A. § 103.

14. Patents ⇐36.2(1)

Evidence of commercial success, when present, must be considered and afforded appropriate weight in determining obviousness of patent claims. 35 U.S.C.A. § 103.

15. Patents ⇐16.29

Defendant failed to establish by clear and convincing evidence that claims contained in reissue patent no. 31,144 for a multistation telephone switching system were invalid for obviousness. 35 U.S.C.A. § 103.

Alfred P. Ewert, Morgan, Finnegan, Pine, Foley & Lee, New York City, argued for plaintiff-appellant. With him on the brief were Jerome G. Lee, Robert A. Molan and Richard J. McGrath.

Howard Karasik, Sherman & Citron, P.C., New York City, of counsel.

Lawrence G. Kurland, Stiefel, Gross, Kurland & Pavane, P.C., New York City, argued for defendants-appellees Feil, et al.; Lance J. Lieberman, Daniel L. Dolgin, Towne, Dolgin, Sawyer & Horton, New York City, Peter R. Stern and Theodore S. Steingut, Berger, Steingut, Weiner, Fox & Stern, New York City, were on the brief.

Before DAVIS, SMITH, and NEWMAN, Circuit Judges.

PAULINE NEWMAN, Circuit Judge.

Interconnect Planning Corporation (IPC) appeals from the summary judgment of the United States District Court for the Southern District of New York, *Interconnect Planning Corp. v. Feil*, 587 F.Supp. 1495, 223 USPQ 961 (S.D.N.Y.1984), holding invalid all the claims of IPC's Reissue Patent No. 31,144 entitled "Multi Station Telephone Switching System", invention of Thomas E. Feil, for failure to meet the conditions for patent validity under 35 U.S.C. § 103, and dismissing IPC's count for patent infringement. We hold that invalidity under § 103 has not been proven, as a matter of law. We vacate the summary judgment of invalidity and dismissal of the infringement count, and remand to the district court.

Background

The claims of Reissue Patent No. 31,144 are for certain telephone systems known as "trader turrets", which are multi-line telephone consoles used by the financial community in trading networks for securities, commodities, currency, and the like. The purpose of these systems is to facilitate concurrent telephone connections for traders requiring multiple sources of price information, conducting multiple transactions, and generally meeting the communication demands of busy, often hectic, financial trading enterprises. Trading rooms may house a hundred or more trader turrets.

Because of the large number of lines and connections required and the specific needs of these communication networks, these systems are complex. A high degree of reliability is required in their operation, because even momentary failures can be extremely costly.

The record shows that the Feil trader turrets rapidly achieved commercial success, displacing other systems then in use. IPC attributes the success of the Feil invention to its novel system "architecture", which enabled ease of operation, high capacity, and improved reliability over the systems then available. IPC's sales of the Feil trader turrets, according to the record, grew from $320,000 for 20 units in 1974, its first year, to $27,900,000 for 3500 units in 1983.

Thomas Feil, the inventor, was formerly an officer and part owner of IPC. In 1977 Mr. Feil formed the defendant company V Band Systems, Inc., and in 1980 Mr. Feil left IPC and joined V Band, of which he is president and chief executive officer. Defendants make and sell the trader turrets that are here accused of patent infringement.

On November 21, 1980 IPC filed suit in the Southern District of New York asserting infringement of U.S. Patent No. 3,991,282 (the '282 patent), invention of Thomas Feil. Defendants Feil and V Band raised the defense this patent was invalid in terms of 35 U.S.C. § 103. IPC's count for unfair competition was dismissed by the court and is not before us. Various counterclaims were separated and are apparently still pending.

In May of 1981 IPC filed in the U.S. Patent and Trademark Office (the PTO) an application to reissue the '282 patent. IPC cited to the examiner articles by M.E. Ozenberger and W.H. Keith, both of the Bell Telephone Laboratories, on which articles defendants were relying before the district court, and which had not previously been before the examiner. The district court refused to stay the action before it pending completion of the reissue examination, and therefore the reissue examination was suspended by the PTO in accordance with its rules. On defendants' motion for summary judgment, the district court on June 1, 1982 held all claims of the '282 patent invalid for obviousness under 35 U.S.C. § 103. *Interconnect Planning Corp. v. Feil*, 543 F.Supp. 610, 614–19, 215 USPQ 734, 736–41 (S.D.N.Y.1982).

Following this decision, at IPC's request the PTO resumed examination of the reissue application. The court's decision was provided to and considered by the examin-

er. A supplemental reissue declaration by IPC referred to this decision as a basis for the reissue application. The '282 patent was surrendered, and on February 8, 1983 the PTO granted the reissue patent, RE 31,144, IPC having restricted its claims in various ways and having overcome the newly cited prior art.

Defendants moved for summary judgment of invalidity of the reissue patent, asserting collateral estoppel based on the court's decision on the '282 patent, and also asserting invalidity under 35 U.S.C. § 103. IPC resisted the motion, and the parties' memoranda, affidavits, depositions, and other documents are of record. For reasons similar to those of the 1982 decision, the motion for summary judgment was granted on June 20, 1984.

That decision, holding all of the reissue claims invalid, was certified and made final under Fed.R.Civ.P. 54(b), with instructions by the court that IPC "attempt to have any appeal ... heard at the same time and before the same panel" as any appeal from a decision on the same patent by the United States District Court for the District of New Jersey.[1] We agreed. Both appeals are decided this day.

Although both appeals involved similar issues and argument, specific to the New York suit are certain procedural issues, as discussed *infra*.

Collateral Estoppel

Defendants argue that IPC's appeal rights are curtailed on the basis of collateral estoppel. Two separate but related issues of estoppel are raised, both arising out of the district court's 1982 decision on the '282 patent.

A.

Defendants assert first that IPC can not now appeal from or argue those aspects of the 1984 decision on the reissue patent which are "common to" the 1982 decision on the '282 patent, on the ground that those aspects could have been appealed earlier, and that it is too late to do so now. IPC asserts in response that (1) the issues are not the same, (2) a different patent is involved, and (3) the 1982 decision was not final.

[1, 2] Considering the finality issue, for collateral estoppel to arise the prior decision need not have been final in the sense of 28 U.S.C. § 1291 but, in the words of the Restatement, the prior adjudication must have been "sufficiently firm to be accorded conclusive effect". Restatement (Second) of Judgments § 13 (1982). Sufficient firmness, according to the Restatement, requires that the party against whom the estoppel is asserted have had the right, even if not exercised, to challenge on appeal the correctness of the earlier decision. Restatement (Second) of Judgment, § 13 reporter's note comment f (1982). Defendants argue that IPC had three such opportunities: appeal under 28 U.S.C. § 1292(a)(1), which governs appeals from interlocutory orders involving injunctions; appeal under 28 U.S.C. § 1292(c)(2), which governs appeals in patent infringement cases final except for an accounting; and appeal under Fed.R.Civ.P. 54(b), which governs judgment on fewer than all of multiple claims in an action.

None of these situations controls the case before us. 28 U.S.C. § 1292(a)(1) relates to orders involving injunctions, and although defendants argue that IPC's complaint necessarily invokes this section, this does not impart automatic appealability to interlocutory orders that do not involve injunctions. As for 28 U.S.C. § 1292(c)(2), the district court's judgment was not final except for an accounting, in light of the pendency of counterclaims. 9 J. Moore, B. Ward, & J. Lucas, Moore's Federal Practice, ¶ 110.19[4], at 220 (1985). Fed.R.Civ. Proc. 54(b) requires that the court have expressly directed entry of a final judgment, and that "[i]n the absence of such determination and direction, any [decision] which adjudicates fewer than all the claims

1. *IPC Communications, Ltd. v. Standard Teleservices Supply, Inc.*, No. 81-1832D (D.N.J.1984) (unreported), *vacated and remanded*, No. 84-1599 (Fed.Cir.1985) (unreported).

... shall not terminate the action as to any of the claims". *See also* 6 Moore's Federal Practice ¶ 54.42, at 813.

Neither IPC nor the defendants asked the district court to enter a final judgment on its decision holding the '282 patent invalid, and the court did not do so. Defendants assert, however, that IPC should now be estopped because it did not move for finality of the ruling nor request that the judgment be certified for interlocutory appeal. An application for certification is by no means certain to be granted and, in this case, IPC's eventual request for certification of the original decision was opposed by defendants and was refused by the court.

The law of collateral estoppel is not intended to penalize a party for declining to try to take a piecemeal appeal. Further, the '282 patent had been placed in reissue, and an appeal on the merits of patent claims for which reissue was being sought would have been a meaningless exercise, as may have been recognized at the time.

We conclude that the district court's 1982 decision on the '282 patent claims, a decision not final, not certified, not appealed, and mooted by subsequent events, lacks collateral estoppel effect for the purpose urged by defendants. The issue here on appeal is the validity of the claims of the reissue patent, an issue that did not exist at the time of the decision on validity of the '282 patent claims. There is no estoppel against appellate review of all aspects pertinent to the decision on the reissue claims. 1B Moore's Federal Practice ¶ 0.441[3.–3], at 737.

B.

IPC asserts that the district court incorrectly invoked collateral estoppel when it analyzed the reissue claims by comparing them with the original claims of the '282 patent, then applying prior art only to the differences between the reissue claims and the original claims. Our predecessor court, the U.S. Court of Claims,[2] has confronted related situations, wherein estoppel was raised as to unadjudicated claims of a patent whose other claims had been adjudicated in an earlier action. The Court of Claims adopted a pragmatic approach, stating that the first step was to determine whether any new issues were raised as to the nonlitigated claims. In *Westwood Chemical, Inc. v. United States*, 525 F.2d 1367, 1375, 207 Ct.Cl. 791, 187 USPQ 656 (1975), *adopting* 186 USPQ 383, 389 (Ct.Cl. Tr.Div.1975), the court said:

> Where obviousness is the basis for the prior invalidity holding, an inquiry into the identity of the validity issue is more properly phrased in terms of the factual inquiries mandated by *Graham v. John Deere Co.*, 383 U.S. 1, 17, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966), as a prerequisite to such a validity determination.

Applying the *Graham* guidelines, the court said:

> Thus, the inquiry should be whether the nonlitigated claims present new issues as to the art pertinent to the nonlitigated claims; as to the scope and content of that art; as to the differences between the prior art and the nonlitigated claims; and as to the level of ordinary skill in that art. If none of these inquiries raises any new triable issues, then the obviousness determination in the prior proceeding should be equally applicable to the nonlitigated claims.

Id. See also Bourns, Inc. v. United States, 537 F.2d 486, 210 Ct.Cl. 642, 199 USPQ 256 (1976), *adopting* 187 USPQ 174 (Ct.Cl.Tr.Div.1975); *Carter-Wallace, Inc. v. United States*, 496 F.2d 535, 538, 204 Ct.Cl. 341, 182 USPQ 172, 175 (1974) (in determining the applicability of the estoppel, the first consideration is "whether the issue of invalidity common to each action is substantially identical.").

The question of substantial identity of reissue claims arose in *Plastic Container Corp. v. Continental Plastics of Okla-*

2. In *South Corp. v. United States*, 690 F.2d 1368, 215 USPQ 657 (Fed.Cir.1982), the Federal Circuit adopted as precedent the decisions of the Court of Claims and the Court of Customs and Patent Appeals.

homa, Inc., 607 F.2d 885, 203 USPQ 27 (10th Cir.1979), *cert. denied*, 444 U.S. 1018, 100 S.Ct. 672, 62 L.Ed.2d 648, 204 USPQ 696 (1980), wherein the court determined that the reissue claims were not substantially identical to the original claims, and therefore that collateral estoppel did not apply.

In *Bourns*, responding to plaintiff's argument that according collateral estoppel effect to non-identical adjudicated claims would amount to treating the claims previously held to be invalid as prior art, the court agreed that this would be inappropriate:

> A domino approach in which each successively narrower claim is compared with the one before it, not with the prior art, is inappropriate since it improperly gives prior-art effect to the subject matter of an invalid claim. *In re Craig and Street*, Cust. & Pat.App., 411 F.2d 1333, 1335 (1969).

537 F.2d at 493, 187 USPQ at 179.

[3] The district court compared the reissue claims with the '282 claims, and erroneously concluded that reissue claims 1 through 6 were substantially identical to the original claims, and that reissue claims 7 through 9, although not substantially identical, involved some substantially identical "issues".

[4] This erroneous legal conclusion may have compounded the error in the next step, wherein the court compared the differences between the original and the reissue claims with prior art that was pertinent only to those differences, thus effectively giving the original claims prior art effect—the pitfall against which *Bourns* cautioned:

> A claim may be invalid for obviousness under 35 U.S.C. § 103 but still describe a combination not found in the prior art. Moreover, it is well settled that each claim of a patent is entitled to a presumption of validity and is to be treated as a complete and independent invention. 35 U.S.C. §§ 282, 288. *Leeds & Catlin v. Victor Talking Machine Co.*, 213 U.S. 301, 319 29 S.Ct. 495, 53 L.Ed. 805 (1909); *Smith Industries International v. Hughes Tool Co.*, 396 F.2d 735, 736 (5th Cir.1968).

Id. When a patent has been reissued with claims that are not substantially identical to the original claims, the invention as a whole, as now claimed, must be evaluated in terms of 35 U.S.C. § 103. The original claims, whether valid or invalid, are not prior art against the reissued claims.

The Summary Judgment

The proceeding from which this appeal is taken was styled "summary", in that the court's decision was made on defendants' motion for summary judgment. The earlier decision on the '282 patent was also made on defendants' motion for summary judgment. IPC contends that the matter was inappropriate to summary judgment, in view of the presence of disputed issues of material fact.

Defendants Feil and V Band argued before the district court, and repeat before us, that no material fact is in dispute, that the questions before the district court and before us in this appeal are purely legal ones, and that the issue was properly dealt with summarily. In its discussion of reissue claims 7 through 9, which claims had no counterpart in the original patent, the district court referred to "claims and issues that have not yet been subjected to a full and fair adjudication", 587 F.Supp. at 1500, 223 USPQ at 965; the court viewed both proceedings as "full" as well as fair, a process not always accomodated by summary proceedings on a documentary record.

[5] Obviousness *vel non* under 35 U.S.C. § 103 is a question of law, whose conclusion requires preliminary determination of several underlying factual issues, as set out in *Graham v. John Deere Co.*, 338 U.S. 1, 69 S.Ct. 1434, 93 L.Ed. 1765, 148 USPQ 459 (1966). *See also Gardner v. TEC Systems, Inc.* 725 F.2d 1338, 1344–45, 220 USPQ 777, 782–83 (Fed.Cir.) (in banc), *cert. denied*, 105 S.Ct. 116, 105 S.Ct. 116, 83 L.Ed.2d 60, 225 USPQ 232 (1984). These factual issues relate to the scope and

content of the prior art, the differences between the prior art and the claimed invention as a whole, the level of ordinary skill in the art at the time the invention was made, and the so-called "secondary considerations" that reflect the contemporaneous response to the invention.

In reviewing IPC's assertions that there were genuine issues of material fact relating to the *Graham* inquiries, we have reviewed the submissions of the parties. Before the court, according to the record, were all the references cited as prior art; as well as the depositions of Examiner Randall P. Myers of the United States Patent and Trademark Office, engineer John Fitzmaurice of New York Telephone, and inventor/defendant Thomas E. Feil; and various documentary exhibits. Also of record were the affidavits of Alan R. Fitzpatrick, president of American Telecommunications Concepts; IPC's technical experts Dennis Maywald and Herbert Goldwag; Thomas P. Bradbury, vice president and treasurer of IPC; and extensive written submissions and arguments.

Although fact and opinion are intertwined in many of these documents, the factual considerations required by the *Graham* analysis appear to have been adequately presented in the record. The technological structure and operation of the devices of the prior art were not in material dispute,[3] although there was strong dispute about the relationship of the teachings of the references to the problems solved by the Feil system, and the weight to be given to evidence of the Feil invention's commercial success.

The district court stated that expert testimony was unnecessary, *Interconnect Planning Corp. v. Feil*, 587 F.2d at 1497, 223 USPQ at 963, and held all of the reissue claims invalid. As will be discussed, we think that the district court reached this conclusion by incorrectly applying the law of 35 U.S.C. § 103.

35 U.S.C. § 103

[6] Those charged with determining compliance with 35 U.S.C. § 103 are required to place themselves in the minds of those of ordinary skill in the relevant art at the time the invention was made, to determine whether that which is now plainly at hand would have been obvious at such earlier time.

The invention must be viewed not with the blueprint drawn by the inventor, but in the state of the art that existed at the time.

The invention must be evaluated not through the eyes of the inventor, who may have been of exceptional skill, but as by one of "ordinary skill". *See Stewart-Warner Corp. v. City of Pontiac, Michigan*, 767 F.2d 1563, 1570, 226 USPQ 676, 680–81 (Fed.Cir.1985).

This is not a facile statutory interpretation. The quality of non-obviousness is not easy to measure, particularly when challenged years after the invention was made. That which may be made clear and thus "obvious" to a court, with the invention fully diagrammed and aided, in this case, by a hostile inventor seeking to eliminate his own invention, may have been a breakthrough of substantial dimension when first unveiled.

The judicial application of uniform standards for determining compliance with 35 U.S.C. § 103 is essential, because the technological incentives fostered by the patent system depend on consistent interpretation of the law. To this end, faithful adherence to the patent statute and guiding precedent fosters uniformity in result.

3. IPC argues that the district court should not have resolved any question of substantial identity between the claims of the original and reissue patents in defendants' favor because that is a contested fact question which should not have been resolved against the nonmovant, citing *Tee-Pak, Inc. v. St. Regis Paper Co.*, 491 F.2d 1193, 1200, 181 USPQ 75, 80 (6th Cir.1974). Under this court's precedent substantial identity between claims, a matter of claim interpretation, is a question of law. *See, e.g., Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 956, 220 USPQ 592, 596 (Fed.Cir.1983), *cert. denied*, — U.S. —, 105 S.Ct. 127, 83 L.Ed.2d 69, 225 USPQ 232 (1984).

A.

[7] Following examination by the Patent and Trademark Office, a duly issued patent is presumed valid, as is a duly reissued patent. The burden of proving otherwise resides with the person challenging its validity. 35 U.S.C. § 282.

This statutory presumption derives in part from recognition of the technological expertise of the patent examiners. A reissue application receives a fresh examination, normally concentrated on those references and reasons that occasioned its filing. The record shows that this reissue application received a supplemental internal review by three examiners because it was involved in litigation.

[8] Although IPC's view is incorrect that the PTO's decision must be given controlling weight, we do agree that the examination procedure and result should be given appropriate consideration and due weight by the court. As stated in *Fromson v. Advance Offset Plate, Inc.*, 755 F.2d 1549, 1555, 225 USPQ 26, 31 (Fed.Cir.1985), "[t]he Examiner's decision, on an original or reissue application, is never binding on the court. It is, however, evidence the court must consider in determining whether the party asserting invalidity has met its statutory burden by clear and convincing evidence".

[9] Upon reissue the "burden of proving invalidity was made heavier", as stated in *Fromson, supra.* This burden must be met by the party asserting invalidity. The district court here relied on the identical references that had been before the reissue examiners, and disdaining the need for expert testimony, reached a different conclusion in law. Although we affirm the obligation of the district court to reach an independent conclusion, the reissue patent reaches the court clothed in a statutory presumption of validity, and clear and convincing evidence is required to surmount this presumption. *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1359–60, 220 USPQ 763, 770 (Fed. Cir.), *cert. denied*, — U.S. ——, 105 S.Ct. 95, 83 L.Ed.2d 41, 224 USPQ 520 (1984).

B.

The court referred to the content of the prior art references in broad terms, occasionally using the title of a reference to explain its pertinence. In this crowded art of telephone systems, as IPC correctly pointed out, it is not enough to show that each of the components used by Feil was known, and had been used in other telephone systems. Feil did not claim to have invented any of the components of his claimed system.

[10] From its discussion of the prior art it appears to us that the court, guided by the defendants, treated each reference as teaching one or more of the specific components for use in the Feil system, although the Feil system did not then exist. Thus the court reconstructed the Feil system, using the blueprint of the Feil claims. As is well established, this is legal error. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 774, 218 USPQ 781, 791 (Fed.Cir.1983), *cert. denied*, — U.S. ——, 104 S.Ct. 1284, 79 L.Ed.2d 687, 224 USPQ 520 (1984).

Illustrative is the court's analysis of reissue claim 1. Pertinent is not only its analysis of the differences between the reissue claim and the prior art, but also the differences between the reissue claim and the original claim. In claim 1, matter enclosed in brackets appeared in the original claim but forms no part of the reissue claim, and matter printed in italics was added by reissue:

> 1. For a telephone system in which telephone communication is capable of being established for each telephone station of a plurality of telephone stations over a standard telephone line by directly connecting each telephone station to a selected standard telephone line of a plurality of standard telephone lines, each of said plurality of standard telephone lines capable of being directly connected to each of said plurality of telephone stations, an improvement comprising:
>
> a plurality of pairs of contacts, with respective pairs of said contacts being

connected with respective ones of said standard telephone lines for allowing said communication;

a plurality of relay coils, with respective ones of said relay coils controlling respective pairs of said contacts to be opened or closed;

a plurality of sets of *non-locking* pushbutton [switch means] *switches* with each set of pushbutton [switch means] *switches* connected to respective ones of said telephone stations with respective ones of said pushbutton [switch means] *switches* of said sets of pushbutton [switch means] *switches* corresponding to respective ones of said standard telephone lines and being connected with respective ones of said relay coils and being depressed for energizing a selected one of said relay coils for closing a corresponding pair of contacts to allow said telephone communication; [and]

an *electronic holding circuit for each of said relay coils, said holding circuits being operative*

to establish a held state after initial energization of the associated relay coil by momentarily depressing the associated pushbutton switch, and

to maintain said corresponding pair of contacts closed while in the held state;

a *logic circuit for each station connected to said holding circuits to detect conditions for releasing the held state;*

each of said stations comprising [first light display means] *a set of status lights,* connection means connecting corresponding pushbuttons of said sets of pushbutton [switch means] *switches* in each of said stations and to said [first light display means] *status lights* for energizing said [first light display means] *status lights* in each station to display the status of each of said plurality of standard telephone lines in each of said stations,

said station further comprising [first light display means] *an active line indicator separate from said status lights* connected to said pushbutton [switch means] *switches* for identifying the standard telephone line *of said plurality of standard telephone lines* that the telephone station is using for said telephone communication.

[11] Reissue claim 1 was held invalid on two grounds. The first ground was that it was substantially identical to claim 1 of the '282 patent, and thus invalid on the basis of collateral estoppel. The court in its 1982 decision referred to Carter U.S. Patent No. 3,150,238 and Foulkes U.S. Patent No. 3,757,056 as disclosing "non-locking buttons, relay coils and pairs of contacts" as applied to the original claim 1. In the 1984 decision the court stated that "Claim 1 has not been changed in such a way that alters the above finding of disclosure by prior art". 587 F.Supp. at 1499, 223 USPQ at 964. This treatment of the reissue claim is not supported by the claim content, as will be apparent from the court's further discussion of claim 1.

As the second ground for its holding of invalidity the court analyzed the changes made by reissue. The court identified three areas as *new* to reissue claim 1, and applied five references to these areas as follows: "*See* Defendants' Exhs. C13, D4–D6 (non-locking buttons); Defendants' Exhs. C4, C7 (holding circuits); Defendants' Exhs. C16, C13 (separate active lines)." *Id.* at 1499, 223 USPQ at 964 (footnotes omitted).

The first set of cited exhibits refers to articles by Keith, "A New Switching System for 'Right of Way' Companies", *Bell Laboratories Record,* Apr. 1968, and Ozenberger, "Voice Communication System for Air Traffic Control", *Bell Laboratories Record,* May 1961, which the court stated taught the use of non-locking pushbuttons. The second set refers to the Carter patent, which the district court said teaches a "Relay Control Circuit" (the title of the Carter patent), and the Foulkes patent which "recites that '[e]ach of these [control] circuits may take any desired and presently known form ... to perform a recognized control

function ... evaluat[ing] the 'hold' feature' ". *Id.* at 1499 n. 6, 223 USPQ at 946 n. 6. The third set of exhibits refers to Simon U.S. Patent No. 3,928,732, which the district court described by its title, "Extension and Line Indicating Display System for Key Telephone System", and Keith, which the district court stated "also discloses separate active lines". *Id.* at 1499 n. 7, 223 USPQ at 964 n. 7.

The court's analysis of the scope of the new material in reissue claim 1 in itself shows the error in the court's conclusion that as a matter of law reissue claim 1 is substantially identical to its parent claim. The claim limitations of the electronic holding circuits for each relay coil, the logic circuit, and separate active line indicator, in combination with the non-locking pushbutton switches connected to the relay coils, were added by reissue. Observing these differences, their relationship to the invention as a whole, and the prior art, we conclude as a matter of law that reissue claim 1 is not substantially identical to the original claim. The 1982 decision, which was directed to the original claims, does not apply to the reissue claims. Collateral estoppel as a basis for the court's holding of invalidity is not supported in law.

Having determined that a reissue claim is not substantially identical to the parent, the parent claim is of no further moment. As stated in *Wayne-Gossard Corp. v. Moretz Hosiery Mills, Inc.*, 539 F.2d 986, 991, 191 USPQ 543, 546–47 (4th Cir.1976), "the original claim was at an end, denuded of all potency save as a bench mark of interpretation, at the time of the reissue's infringement."

The original claim is not prior art against the reissue claim. It is not correct to weigh the reissue claim against the original claim. It is not correct to weigh the changes in the reissue claim against the original claim. It is the reissue claim alone that is to be analyzed in accordance with the *Graham* guidelines, and the differences to be considered are the differences between the reissue claim as a whole and the prior art.

In the court's 1982 analysis of the original claims, to which the court referred in its 1984 decision, the court had identified "six principal features which plaintiff argues are not obvious" and explained why the court concluded that these features are obvious by referring to various prior art references showing various of the features in various contexts. *Interconnect Planning Corp. v. Feil*, 543 F.Supp. at 617, 215 USPQ at 739. As we have observed, it is the emphasis on the obviousness of "features", rather than the claimed telephone system as a whole, that constitutes the flaw in the application of section 103 to the Feil claims. As stated in *In re Shuman*, 361 F.2d 1008, 1012, 150 USPQ 54, 57 (CCPA 1966):

> It is impermissible to first ascertain factually what appellants *did* and then view the prior art in such a manner as to select from the random facts of that art only those which may be modified and then utilized to reconstruct appellants' invention from such prior art.

The court in 1982 summarized its conclusion with respect to these six "features" by observing (1) that although the pairs of contacts and relay coils "is not disclosed in either the Keith Article or the Ozenberger Article", the Foulkes and Carter patents do disclose them; (2) that Keith, Ozenberger, and Foulkes refer to pushbutton switches; (3) that Keith shows a set of display lamps although Ozenberger uses a single lamp, and that Paraskevakos (U.S. Patent No. 3,727,003) and Simon et al. show either a digital display or the incoming line number; (4) that Paraskevakos shows a decoder and that "the diode matrix was no mystery to one engineer" (Thomas Fitzmaurice, of Bell Labs, who testified that he readily understood the Feil system after he was shown it); (5) that Keith shows which lines are active; and (6) that the asserted unique master station hook up with blocking means is shown in Ozenberger and a Verdon patent (U.S. Patent No. 3,819,871). *Interconnect Planning Corp. v. Feil*, 543 F.Supp. at 617–19, 215 USPQ at 739–40.

In its 1984 decision the court added the additional citations of references pertinent to the changes in the reissue claims, as discussed above. As in its citation of references against the various features of the original claims, the court selected from each reference a feature or features that also appeared in the reissue claims. No reference, however, suggested the overall arrangement, the "architecture", of the Feil system.

IPC presented affidavit testimony explaining the references in the context of the state of the telephone systems art at the time, none of which testimony was controverted other than by attorney argument. The most advanced multi-line devices at the time the invention was made, according to this record, used the then state-of-the-art crossbar switching equipment, and electrical or mechanical interconnections or interlocks. The two Bell Labs publications of Keith and Ozenberger, on which defendants and the district court placed substantial emphasis, used crossbar switching. Feil did not.

Mr. Feil's affidavit filed with the district court states "The Ozenberger and Keith articles disclose what I thought I invented in 1974". Mr. Feil made no reference to the crossbar switches required by these references, and offered no discussion of either differences or similarities between his system and those of these references.

The Carter patent used relay switches in the telephone switching system it describes. Carter, of Bell Laboratories, taught the use of quick-release control relays in combination with slow-release work relays, to achieve the specific purposes desired by Carter. Carter also required use of a "locking chain" rather than independently operating relays, and a more complex communication path as compared with Feil's direct connections. Feil established multiple direct connections in a system where theretofore it was believed, according to the record, that crossbar switches would be required.

The Feil system eliminated both crossbar switches and mechanical interlocks or mechanically locking pushbuttons, and instead used relays, a well-known type of switch. But Feil avoided the need (of Carter) to establish potentially large numbers of contacts and operate a concomitantly large number of relays in series in order to connect stations within the system. As IPC's uncontroverted testimony shows, Feil avoided interconnections and interlocks, both of which, according to the Maywald affidavit, had previously been considered necessary to lock out faults. The Maywald affidavit stated that Carter's approach would be "impossible and impractical" in the trader turret application because "[t]o try and accurately control the release times of different relays over a long period of time would be virtually impossible considering the wear and deterioration of components" in a "trader turret network involving some 20,000 or more relays". Maywald's explanation of the technical operation of the references is uncontradicted, although defendants take issue in attorney argument with Maywald's conclusions.

The Foulkes patent, on which the district court also relies, described a "bipolar multiplexing circuit" based on a "contact tree" relay switching arrangement. Foulkes taught a telephone system that Maywald avers, without contradiction, "could not be realistically expanded into large systems like trader turrets". The district court did not explain how the Foulkes or other systems of different circuitry made obvious the different system of Feil's claims.

The Keith and Ozenberger systems, as previously discussed, are different systems from that of Feil. Like the systems of the other references, they contain some elements in common with that of Feil. The Ozenberger system, based on crossbar switches, was designed for air traffic control. The Keith system is described as tailored to the specific needs of "right-of-way" companies, and is a cordless system limited to up to eight consoles of up to a hundred lines. As Keith says, "[a] system of crossbar switches is the heart of the switching system". Neither Keith nor Ozenberger suggests that the crossbars be

replaced with relays and that the other changes be made to produce the admittedly different Feil system.

The novelty of the Feil system is not controverted by the defendants. Its value in trader turret systems has received the ultimate recognition, market success and imitation.

[12] 35 U.S.C. § 103 requires that obviousness be determined with respect to the invention as a whole. *See, e.g., Jones v. Hardy*, 727 F.2d 1524, 1528, 220 USPQ 1021, 1024 (Fed.Cir.1984); *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1548, 220 USPQ 303, 309 (Fed.Cir. 1983), *cert. denied*, 105 S.Ct. 172 (1984); *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1537, 218 USPQ 871, 877 (Fed. Cir.1983). This is essential for combination inventions, for generally all combinations are of known elements. *Environmental Designs, Ltd. v. Union Oil Co. of California*, 713 F.2d 693, 698, 218 USPQ 865, 870 (Fed.Cir.1983), *cert. denied*, — U.S. —, 104 S.Ct. 709, 79 L.Ed.2d 173, 224 USPQ 520 (1984).

[13] When prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577 & n. 14, 221 USPQ 929, 933 & n. 14 (Fed.Cir.1984). There must be "something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination". *Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed.Cir.1984).

Critical to the analysis is an understanding of the particular results achieved by the new combination. The claims here at issue are directed to a combination of known components of telephone systems in an admittedly new way to achieve a new total system. Neither the district court in its opinion, nor the defendants, identified any suggestion in the prior art that the components be combined as they were by Feil or that such combination could achieve the advantages of the Feil system.

Not only must the claimed invention as a whole be evaluated, but so also must the references as a whole, so that their teachings are applied in the context of their significance to a technician at the time—a technician without our knowledge of the solution. The defendants propounded and the district court appears to have followed an analytical method that well illustrates the "mosaic" analogy discussed in *W.L. Gore & Assocs.*, 721 F.2d at 1552, 220 USPQ at 312, where this court said:

> [T]he claims were used as a frame, and individual, naked parts of separate prior art references were employed as a mosaic to recreate a facsimile of the claimed invention.

Defendants refer to the decision of the Supreme Court in *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 96 S.Ct. 1532, 47 L.Ed.2d 784, 189 USPQ 449 (1976). As the Court there held, Sakraida's combination of old elements to wash barn floors with flowing water did not produce a new or different function, and affirmed the district court's holding that " 'all of the elements of [the combination] are old ... and the combination of them ... being neither new nor meeting the test of non-obviousness.' " *Id.* at 274, 96 S.Ct. 1533–34, 189 USPQ at 450. In the Feil invention the combination was admittedly new, and it produced a new system having theretofore unavailable attributes.

Recognizing the difficulty of casting one's mind back to the state of technology at the time the invention was made, courts have long recognized the usefulness of evidence of the contemporaneous attitude toward the asserted invention. A retrospective view of the invention is best gleaned from those who were there at the time. Mr. Feil, the inventor impugning his own invention, now avers that he did no more than did the prior art, specifically the Keith and Ozenberger articles. Mr. Feil's disavowal of his invention is staunch, although he less modestly commented in 1977, be-

fore he left IPC, on the reaction of Bell Labs' engineer at that earlier time:

> He [Fitzmaurice] showed too much enthusiasm. I mean, he was really excited by the thing. Like this is incredible. You guys are geniuses. You're 50 miles ahead of Bell Labs. (App.Vol. VI, F357).
>
> * * * * * *
>
> You know what he said. He said You're 50 miles ahead of Bell Lab? He said "miles", not years, he made it in miles. You're 50 miles ahead of the Bell Labs. (App.Vol. VI, F355).

Mr. Elia of the Republic Bank, one of IPC's customers, attested:

> Upon viewing the equipment, the AT & T people indicated that it was unbelievable. They did not think it could be done. They were surprised that it was done. (App.Vol. VI, F360).

[14] Although the district court remarked in its 1982 decision that evidence of commercial success "cannot be afforded any weight" "in light of my finding of obviousness", 543 F.2d at 619, 215 USPQ at 741, such evidence when present must be considered and afforded appropriate weight. *Simmons Fastener Corp. v. Illinois Tool Works, Inc.*, 739 F.2d 1573, 1575, 222 USPQ 744, 746 (Fed.Cir.1984), *cert. denied*, — U.S. —, 105 S.Ct. 2138, 85 L.Ed.2d 496 (1985); *Jones v. Hardy*, 727 F.2d at 1530, 220 USPQ at 1026; *Medtronic, Inc. v. Cardiac Pacemakers, Inc.*, 721 F.2d 1563, 1575, 220 USPQ 97, 105 (Fed.Cir. 1983); *Stratoflex, Inc.*, 713 F.2d at 1538–39, 218 USPQ at 879; *In re Sernaker*, 702 F.2d 989, 996, 217 USPQ 1, 7 (Fed.Cir. 1983); *In re Mageli*, 470 F.2d 1380, 1383, 176 USPQ 305, 307 (CCPA 1973). IPC offered affidavit and deposition evidence, by two experts in telephone systems and by a Bell system engineer knowledgeable in the field of trader turrets. Their uncontroverted testimony was to the effect that the Feil system was perceived at the time as an exceptional technological achievement.

[15] The requirement that "secondary considerations" be considered in determinations under section 103 aids in evaluating the state of the art at the time the invention was made. *In re Piasecki*, 745 F.2d 1468, 1475, 223 USPQ 785, 790 (Fed.Cir. 1984). It is not pertinent that the invention was easily understood after it was made—a factor that appears to have been considered significant by the district court, *see* 543 F.Supp. at 619, 215 USPQ at 741—but whether it would have been obvious to make the invention at the time. Giving due weight to the market success and contemporaneous reaction to the Feil trader turret system, the record does not contain clear and convincing evidence that the Feil invention of the reissue claims would have been obvious to one of ordinary skill in this art at the time the invention was made.

Reissue claims 2–9 are either dependent on reissue claim 1, include similar limitations, or include additional limitations. Although each claim has been considered separately, they need not here be treated in redundant detail. For each claim we are compelled to the conclusion that the burden of proving invalidity by clear and convincing evidence has not been met.

The summary judgment of invalidity of Reissue Patent No. 31,144, in terms of 35 U.S.C. § 103, is vacated, as is the dismissal of the infringement claim. The case is remanded to the district court for further proceedings consistent herewith.

VACATED and REMANDED.

KIMBERLY-CLARK CORPORATION, Appellant,

v.

H. DOUGLAS ENTERPRISES, LTD., Appellee.

Appeal No. 85-1261.

United States Court of Appeals, Federal Circuit.

Oct. 11, 1985.

Owner of registered trademark of "HUGGIES" disposable diapers opposed